

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper.

Second-class postage paid at Boston, Mass., and additional mailing offices

year

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January 23, 1974

Vol. VIII, No. 4

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## NEWS IN BRIEF

### Telex Loses Bid to Cite IBM For Contempt

TULSA, Okla. — Telex's request for a contempt citation against IBM for failure to supply interface information was dismissed by U.S. district court Judge A. Sherman Christensen in a hearing last week.

Christensen ruled IBM hadn't violated orders handed down last November, and upheld IBM's claim that the information requested by Telex concerned computer design, rather than interfaces.

"The evidence presented here... is insufficient to show IBM failed to comply with Section 3 of the court's decree. Telex has requested information about a function not covered by this part of the order. There has been no willful non-compliance by IBM," he stated.

Telex told the court [CW, Jan. 16] it had not been given interface specifications for connecting more than minimum memory to 370/145 II, 135, 158 and 168 CPUs. It also had not received electrical interface specifications for connecting the 3803 II with the CPU channel, the firm said.

### Nixon to 'Propose' National Criminal Justice System

WASHINGTON, D.C. — A proposal for a nationwide criminal information system was expected to be included in a Presidential address to the nation, but no details are yet available from Attorney General William Saxbe's office.

"The President is going to make his announcement in his State of the Union address but we don't know what it is," an information official said. Saxbe had indicated in a talk with newsmen that Nixon "would have something to say about a criminal information program. We don't have any details," the Justice Department spokesman said.

Other sources, however, expect the announcement to be a formal request for further funding and possible expansion of the Computerized Criminal History system.

### On the Inside

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### 'Warning to U.S. Users'

## Canadian User Sued On Program Patent

By Don Leavitt  
Of the CW Staff

MONTREAL — A major computer user here is being sued for allegedly using a patented software program without paying royalties.

A patent infringement suit recently filed against McGill University is a warning to

"We're getting a hell of an education in software patent law in Canada just for experimentation before we get to the U.S." — Xoma Ltd.

U.S. and other Canadian users that more suits are on the way, according to officials at Xoma Ltd., the plaintiff. The firm has applied for a patent in the U.S. and expects to have it by the end of the year.

"We're getting a hell of an education in software patent law in Canada just for experimentation before we get to the U.S.," Xoma Vice-President William Solomon warned last week.

The company has thus begun its promised campaign to require "reasonable royalties" be paid for the use of an accounting system on which it received a Canadian patent last fall [CW, Nov. 28], and to cut off any infringing on Xoma's rights to the patent.

#### Notices Sent

The suit against McGill University and the director of the university's computer center charges both with infringement and unauthorized use of the software. Xoma has also sent notices to a number of firms that aren't using Xoma's actual program, warning them they may still be infringing and advising them to contact Xoma to begin negotiations on license fees.

Xoma had been buying time on McGill's IBM 360/370 equipment, and reselling it to third parties who accessed the equipment and Xoma's software through terminals. The third-party work reportedly consisted of accounting functions included in the patented software.

The suits against McGill and Prof. David Thorpe were filed in Quebec Superior Court in late December. They seek \$25,000 damages for McGill's continued support of Xoma software users, after Xoma itself had been cut off from the

McGill computers because of "substantial" bills owed the university by the consulting firm.

Attorneys for McGill and Thorpe have met with Xoma's lawyers and negotiations are under way, according to Solomon, but the situation is less clear with regard to other firms that received Xoma's notices.

The Canadian Association of Data Processing Service Organizations (Cadapso) has counseled its members to disregard Xoma's letters. On the other hand, Solo-

mon said, his firm is "in the midst of signing [a number of] royalty licenses with individual users, and we are franchising the system to service bureaus."

Cadapso argued that the patent will not stand up in court and that the patent office was at fault for issuing the patent in the first place.

The association has issued what spokesmen refer to as "an English language version" of the patent to explain what the original document leaves unclear.

(Continued on Page 4)

## Judge Halts Court System, Clerk Takes Him To Court

By Patrick Ward  
Of the CW Staff

PARMA, Ohio — Computerizing municipal court records became a "political football" here recently when the presiding judge ordered the program halted and the court clerk retaliated by bringing the judge to court.

The attempted computerization caused "great inconvenience, didn't do what it was supposed to do and was in questionable compliance with legal requirements," contended Judge George W. Spanagel.

Court clerk Walter Shipka maintained that the judge knows nothing about DP and the halt was a power play to take authority from the clerk's office.

Shipka is seeking a temporary injunction to stop the judge from preventing computerization. A ruling is expected soon.

#### The System in Question

Shipka said when he was elected four years ago he started planning the computerization to modernize the court process and speed up tracing of information.

In January 1972, he began running the computerized plan in parallel with the existing manual operation. The system includes an alphabetical listing of all cases to speed recovery of records when inquirers do not know case numbers.

There is also a daily traffic docket

which lists the names of those scheduled to appear in traffic court. This listing includes the name of the violator, the ticket number, the case number, the date of violation and the legal section number violated, according to Shipka.

Open warrants, listed alphabetically and geographically, are the third phase of the program. These allow the police to serve three or four warrants at a time for a given area, Shipka explained.

A fourth phase, running only on an experimental basis in parallel with the manual operation, is a disposition docket, with information from the traffic docket, plus the disposition of the case, the fine, (Continued on Page 2)

## DP to Help Cut False Arrests

By Marvin Smalheiser  
CW West Coast Bureau

SAN FRANCISCO — A new system is being tested here to defuse an explosive traffic citation problem caused by the arrests and jailing of motorists for fines they have already paid.

Faced with five major suits in the last year because of the arrests, the city has installed 20 IBM 3270 terminals and five 2740s in the Traffic Fines Bureau of the Hall of Justice.

The terminals connect to an IBM 370/155 in city hall about a mile away.

They are used to keep track of the payment of traffic fines and serve as part of a system programmed to produce reminders to take data out of the warrant system after a fine is paid.

Until March 1, only about 2% of the citations are being cycled through the new system — in parallel with the manual system.

But if the test is satisfactory the entire system will be switched over.

Stanley Collis, chief of public safety systems for city and county EDP, said the system is expected to increase the cash flow from the 5,500 citations a day processed because of timely reminders to motorists.

When the full system goes on-line, he said, some enforcement functions will be added, such as repeat notices to motorists who haven't paid and notices to issue warrants.

## Group Spirit Sparks L.A. Carpool

CW West Coast Bureau

LOS ANGELES — A five county effort to match commuters through computers in this area on a massive basis was scheduled to be launched this week with the aid of a number of companies in data processing.

David Grayson of the Southern California Auto Club, who is coordinating the effort, said he hoped to create a carpool data bank of 500,000 to one million persons.

But he said the campaign would be considered a success if 100,000 or more people joined carpools during the first year.

The first matching of commuters is expected in about 30 days and Grayson said a broad spectrum of city, county, state and community groups

are working to get the program off the ground.

The data bank is scheduled to be put on the city's IBM 370/158 for the time being. Grayson said a non-profit corporation being set up will take full responsibility for data processing but will continue to seek help from every quarter possible.

Arrangements now call for Aerospace Corp. to provide the principal systems and programming assistance.

There will also be technical assistance from Rockwell International and TRW.

The Association for Data Center Owners and Managers (Adcom) has volunteered its technical services and will help educate the 3,200 companies (Continued on Page 4)





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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1974 by Computerworld, Inc.

50 cents a copy; \$12 a year in the U.S.; \$13 a year in Canada; all other foreign, \$36 a year. MARGARET PHELAN, circulation manager. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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## Compatibility Main Concern

## World Gathering Discusses Justice, DP

STRASBOURG, France — The main area of concern in the development of judicial computer systems is to ensure compatibility among systems, so that when political and financial conditions permit, all systems could be united in a national, or even international resource, according to attendees at the first International Congress on Judicial Systems held here recently.

The conference addressed three specific areas in law which computers have penetrated: documentation, management and the formulation of laws.

Faced with innumerable laws, regulations and points of doctrine which appear each year, in addition to the number of court decisions, jurists have turned to automation to solve their documentation problems. Already, France has three organizations devoted to legal documentation,

while Belgium and The Netherlands each have one.

The systems are not without problems, however. Format questions arise as to whether full text, summary or abstracts of key words should be used to index the systems. All three methods are in use in various places.

The opinion of the congress was that full text is best suited to recording laws, while abstracts sufficed for jurisprudence (statutes) and was the only way to cope with doctrine (policy), according to an article in *01 Informatique*, a French DP publication.

How should access to files be handled? A terminal in each lawyer's office should be the optimal situation, however the average lawyer is not ready to handle this function, the congress opined, and finan-

cially, individual terminals are premature.

The peculiarities of judicial administration management present an area of challenge for system designers. Automation of the court clerk's files and of public records are also being implemented, though access control is a problem.

The conference revealed that in the USSR, computers are mainly used for preliminary investigations particularly in the area of evidence. In Germany, a real estate register is being automated, while Rumania is trying to provide access to documentation centers to all lawyers and judges.

The final area discussed at the conference was that of law making. In this area, the congress contended, computers can be of greatest help by providing statistics, and simulating the long-range effects laws would have if enacted.

## Ohio Judge, Court Clerk At Odds Over DP System

(Continued from Page 1)

attorney involved, costs and costs paid.

In January 1973 the state auditor approved the final implementation of the first three phases of the system and the judges have been using it since then, Shipka said.

## 'A Great Inconvenience'

However, the judge terminated all phases of the program because "the manner in which it was done caused a great inconvenience upon the court in that it took papers and files to other places so they were not available when needed," Spanagel claimed.

Spanagel called the whole episode "a tragedy that should not be attributable . . . to data processing or computerization," but rather to "incompetent personnel and to embarking upon a program without those first voluminous basic conferences and meetings and analysis of the

problems and intended use of the program."

Spanagel said no one ever came to the judges and asked what they wanted. "And I'm sure no one ever opened the law books to see what the statutory requirements say must be kept in this area."

He said the data was neither entered nor retrieved quickly enough. As a case comes in, "it is given a case number and a card is punched for it . . . then at some later time that card is put on magnetic tapes, disk, whatever they use, and then at a later time they are brought out by way of a printout which becomes the criminal docket."

That is not entering the information at "the commencement of the action" as required by law, the judge said.

Shipka's lawyer, on the other hand, maintains that the crux of the dispute is centered on the final sentence of the Ohio Revised Code chapter outlining duties of the court clerks.

"This section gives clerks other duties and powers as prescribed to him by a rule or order of the court. No higher court has ever ruled on who has jurisdiction over the clerk's office" under this section of the law, he said.

The judgment sought by Shipka would define this section.

## Not Just the Law

But there were other problems besides legalities with the system, according to Spanagel. He mentioned that the alphabetical index failed at least once when an inquiry came in about whether there were

any cases pending against a person. And he also charged that Shipka had failed to maintain parallel manual records of dispositions, even though the computerized portion of that phase of the program had not been officially approved.

## Admits Errors

Shipka admitted the errors, but countered that the judges have been unwilling to accept the fact that there will be bugs in a newly developed system. "More so, I don't think they've been willing to try to get their teeth into it to find out what's happening."

"The only area where we really had a problem was when a case came in late, say for the police department, and we had already run the printout," Shipka recalled.

"We would have to do it as an addition to the docket, but that was the only area where the judges had room for a complaint," Shipka maintained.

## Notice to Readers

Bad weather forced delays of up to three days in delivering last week's issue of *Computerworld*.

A major snowstorm forced airports to close and many flights were cancelled. As a result, editorial material was delayed reaching the printing plant, and the issue of Jan. 16 was mailed almost three days late.

Our apologies for any inconveniences to readers.

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# Economy of Operation Key Consideration in On-Line Programming

PRINCETON, N.J.—The cost factors involved in installing and operating an on-line system for program development should be carefully weighed before a firm commitment is made, according to ADR, the Princeton-based software house. The cost of remote terminal devices and T/C controllers may be insignificant when compared to the costs associated with installing and integrating the software into a particular environment and operating it for many hours each day. These combined expenses may far exceed monetary savings resulting from improved turnaround and increased programmer productivity.

A careful analysis should be made of additional resources—larger CPU, more core, more direct access devices—that may be required to maintain an acceptable level of batch production during the hours that the on-line programming system is in operation. Dedicating an entire CPU to program development as is commonly done with TSO or VM is an

alternative, but a very expensive alternative, to running both production and development work concurrently on the same machine. Ideally, a remote programming system should operate effectively in a multijob environment, maintaining a high degree of terminal responsiveness without degrading background operations or reducing overall system throughput.

## Roscoe Cost Effective

ADR suggests that its conversational text editing RJE system, ROSCOE, meets cost-effectiveness criteria better than comparable IBM-supplied software. ROSCOE provides versatile services to applications and systems programmers as well as to operations, design, and clerical personnel. The system contains data entry and editing facilities, compressed library storage services, and remote job entry and output retrieval functions. Also included are syntax checkers for COBOL, FORTRAN, PL/I and the Job Control Language (JCL). A unique

capability of ROSCOE is its command procedure language which supports terminal I/O operations, and includes decision making, branching, and iterative types of instructions. ROSCOE command procedures are commonly used for job stream generation and prompting (or training) of clerical personnel.

To increase the versatility of the system, ROSCOE monitor services allow an installation to interface auxiliary programs with ROSCOE for on-line execution in a conversational mode. ADR supplies with ROSCOE a limited number of auxiliary programs, including a UTILITY subsystem which provides OS data set management services to systems programmers.

ROSCOE will operate on S/360-40 and S/370-135 CPUs and larger under OS MFT and MVT with or without HASP, or with VS1 and VS2. It supports a variety of remote terminals including 2741, 2260, 3270 and teletypes of all speeds.

The system is generated to the user's specifications and installed by ADR personnel. The installation generally takes about one hour and is followed by classroom training of systems personnel and applications programmers. User guides and detailed system operation manuals are provided; source code is available on request.

The system is available under monthly or permanent licenses which incorporate a 30-day no-obligation acceptance period. ROSCOE is currently installed at 20 sites in the U.S., Canada, and abroad. ADR reports that 15 additional installations are scheduled for the first quarter of 1974.

## ROSCOE In Use At VS Sites

PRINCETON, N.J.—Almost half of the existing ROSCOE installations are using one of IBM's virtual storage operating systems, according to ADR, manufacturer of the remote programming package. The most common environment for ROSCOE is an S/370-145 CPU with 512K of main memory operating under VS1. These installations generally have 3330 disc drives and local 3270 display stations. Users report that terminal response time is consistently good, and background batch processing is not noticeably affected by operation of the on-line programming system. One of these VS1 installations recently upgraded to VS2, and ROSCOE was successfully transferred to the new environment. According to ADR, several additional VS2 installations of ROSCOE are scheduled for the first quarter of 1974.

## Operates Entirely in Virtual

In a VS1 or VS2 environment ROSCOE operates entirely in virtual storage under control of the VS paging supervisor, usually in a virtual region or partition of 120K. In an OS MFT or MVT environment a minimum 80K main memory partition or region is required. In most cases, installations can change from one operating environment to another without regenerating ROSCOE.

## Utility Aids OS Data Set Maintenance

PRINCETON, N.J.—A major new facility has been added to ROSCOE, ADR's conversational programming system. The new capability, called The UTILITY Subsystem, provides on-line OS data set management services to systems programmers responsible for the maintenance of OS and its direct access resources. Working from a ROSCOE remote terminal, a systems programmer can now allocate, catalog, rename, write and scratch data sets; he can also build, find and delete entries in the OS catalog. All operations are password-protected, allowing access by authorized personnel only. The data management functions provided by the ROSCOE UTILITY Subsystem are comparable to those provided by TSO and the IBM batch utility programs.

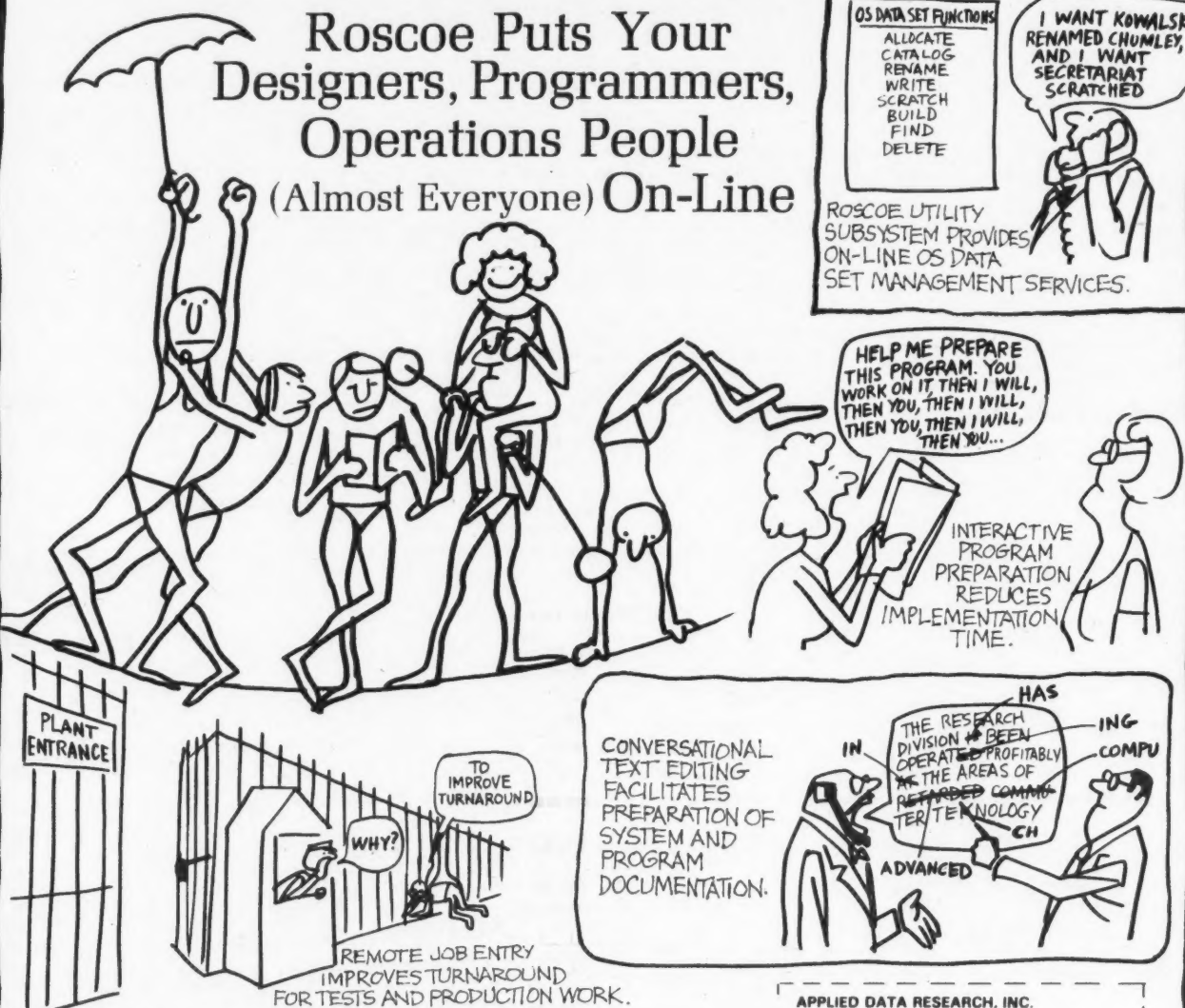
## Runs Under Monitor

The UTILITY Subsystem operates under the ROSCOE monitor and requires about 25K of real or virtual storage. It can be used with other auxiliary programs serviced by the ROSCOE monitor, including ADR-supplied syntax checkers or special purpose programs prepared by the user installation. The UTILITY Subsystem and other monitor programs are supplied as a standard part of the ROSCOE package.

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## Planning in Paterson - Part II

# DP Support Key Factor

By Anthony DeFranco  
and Dr. Anthony Sanzone

Special to Computerworld

PATERSON, N.J. — The question of using time-sharing facilities or an in-house system is crucial to a serious user. In the case of the Paterson Planning Department, the decision about which system to use was based on a careful study of the advantages and disadvantages of each.

Time-sharing services can provide a real-time system for reasonable rates. For example, as much as 75 off hours or evening hours of processing time for \$500 per month with unlimited off-line storage for \$30 per month is available from several time-sharing facilities. At the same time, the hardware and software advantages of a time-sharing system are:

- Extent of languages available
- The interactive mode
- Excellent diagnostics
- Rapid retrievability of data (1 hour)
- A secretary can type information on paper tape off-line
- A terminal can be physically located in the work area
- Immediate accessibility to technicians to resolve any possible problems.

In terms of an in-house system, the cost element becomes an advantage when the hardware is used efficiently.

In addition, users may have access to the hardware during regular operating hours rather than off hours. With a time-sharing system, the costs for regular hours in most instances would be prohibitive.

Also, data processing personnel can become familiar with the requirements of their users and are able to integrate the different files.

With a sophisticated in-house system, terminal capacity can be established which would then give the users most of the advantages of a time-sharing system.

But perhaps the most important consideration with an in-house system is the degree of technical support available to the end user from the data processing staff. For the Paterson planning staff, it was necessary to have the system and staff support of Fortran IV, since that is the language best suited to planners' work.

Paterson's DP department proved to be quite sensitive to the needs of the planning staff, due in part to the fact that the director of DP had a background in urban planning. The department was willing to support Fortran, making the use of the in-house IBM 360/22 with 64K sufficient to meet the planning staff's needs.

The success the planning staff has had with data processing can best be attributed to the desires of both the planning board and the DP department to establish a meaningful work relationship for the development of an urban information system. The board intends to continue working with the DP personnel to insure that once the data files are established, they are properly maintained.

Anthony DeFranco is a city planner and Anthony Sanzone a DP consultant for the planning staff in Paterson, N.J.

## Canadians Revise Software Duty, Pending Study

Special to Computerworld

OTTAWA, Ont. — After many representations by the country's EDP industry, the duty on imported software is being reviewed by the federal government. Until recently customs officials had been confronted with the difficult task of valuing for duty purposes software coming into the country, chiefly from the U.S.

Now a customs memorandum has been issued advising customs ports of entry that duty will only be applied to the value of the physical medium on which the software is stored. The new valuation procedure will remain in effect until Nov. 19, 1974, pending formulation of a final government policy.

Many in the DP industry, including the Canadian Association of Data Processing Service Organizations, had advocated elimination of duties on any data or software being imported into Canada.

EDP managers pointed out that it is virtually impossible to separate the software component of a DP system from the entire system itself, when determining the value of an item. Fair market value of software may be completely arbitrary, they argued, and dependent upon the media on which the software is encoded.

Implementation of tariffs was also mentioned as being difficult to administer and there are many ways of "beating the system," as one DP manager noted, "such

as simply transmitting the instructions embodied in the software via telecommunications lines." Such a move is likely to go undetected, he said.

## Voltage Cut Needn't Hurt

WASHINGTON, D.C. — DP users should contact their local utility representatives periodically to determine if input line voltages are at nominal levels as one step in assessing the effects of power reductions on specific installations.

That's the advice of the Environment and Safety Committee of the Computer and Business Equipment Manufacturers Association (Cbema) here in response to recurring questions about brownouts.

Experience has shown that in some severe cases equipment operation was not unduly impaired when voltage was reduced 8% from the nominal level, if the input voltage to the equipment was correct before the reduction, a report by the group said.

However, now there is also an increased probability that power line transient disturbances due to load shedding and line switching could impair equipment operation while voltage reductions are in effect.

If the input voltage to the equipment was not up to nominal level prior to the utility reduction in voltage delivered,

equipment malfunction or shutdown could occur.

When a utility company announces a 3%, 5% or 8% reduction in voltage, the measurement of that voltage reduction is made at the generating point.

Actual voltage drop at the customer end of the line could exceed 8% and presents the risk of equipment malfunction, Cbema said.

In the case of planned power interruptions, a user should check with his local utility to determine when such "rolling blackouts" are scheduled for his location in order to organize priorities accordingly, Cbema advised.

In order for the business and computer equipment user to know the possible effect of a brownout to his equipment, especially an 8% voltage reduction, the customer, utility representative and manufacturer should confer on the specific case and, from the factors involved, assess the risks, the group recommended.

## Carpool Group Effort

(Continued from Page 1)

that will be asked to participate.

Grayson said the city and other technical advisers are now working on modifications for programs to be used.

The pool is intended to embrace commuters in the city as well as the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura.

No fees are planned for the carpool matching.

Grayson said so far the entire operation has been a strictly volunteer community effort.

If Los Angeles gets its million-member data bank, and if the program only attains a 26% to 28% match success rate, then over a quarter million cars will be removed from the road in this area, sources noted.

## You Pay for That Pound of Flesh

NEW YORK — DP executives, that extra portion of cheesecake is costing you money.

According to a survey by the Robert Half personnel agency, overweight financial and DP executives are more likely to be paid less than trim people. For the survey, the agency checked the height, weight and salaries of program managers, systems managers and DP managers, as well as financial executives, picked at random.

The results were checked against insurance industry charts, and persons weighing 10% more than the chart figures were called overweight.

Only 9% of 1,500 executives earning

between \$25,000 and \$45,000 were "overweight." But almost 40% of the 13,500 executives paid between \$10,000 and \$20,000 were "overweight."

"Some fat people pay a penalty of \$1,000 a pound," commented President Robert Half.

When companies have a choice of hiring or promoting two persons, one overweight, they frequently choose the thinner, observed B. Willens, vice-president.

In addition, he said, the firm receives requests specifying that the candidate not be overweight.

## Ga. Residents Pay Their Bills But Not With Cash or Checks

ATLANTA — Many Georgia residents have been paying bills and making purchases without cash or checks since May under a system implemented by a major group of Georgia banks, organized under the Committee on Paperless Entries (Cope).

The "less check" society may not be here just yet — but it is coming sooner than many people think, according to Dr. Allen H. Lipis, director of the project.

He said Bill Check, the paperless entry service now used by most of the banks in Georgia, is a "less check" system.

Upon receipt of a utility bill, for example, the customer places his signature across the stub, indicating the amount of

money he wishes to pay, and drops the stub in an envelope to the utility company. That amount is automatically deducted from his checking account.

This one-time authorization to deduct a specific amount from the customer's account eliminates check handling by the customer, the utility company and the bank.

The customer receives a regular monthly statement from his bank itemizing payments made under the Bill Check system. Safeguards within the system protect the customer against error or inaccuracies, Lipis said.

### Logical Progression

"Historically, we have progressed from barter to cash to check as the most efficient method of transferring assets," he said. "We view Bill Check as the next logical step before we achieve a workable electronic funds transfer system."

Lipis' group has just completed a study related to the application of a point-of-sale terminal system as a part of their continuing effort to eliminate checks.

The Atlanta Payments Project which Lipis directs, is the research and implementation arm of Cope.

The Atlanta system is not unlike Giro, a manual check-elimination system used in Europe since before World War II. In Europe, however, consumers bring cash to a transfer agency such as the Post Office, which then effects the transaction.

Bill Check does eliminate this "middle man," sources noted.

## RCC Denies Violation Of Fair Credit Act

ATLANTA — Retail Credit Co. (RCC) has denied allegations by the Federal Trade Commission that it violated the Fair Credit Reporting Act and used deceptive and unfair practices in its computerized credit reporting business [CW, Dec. 26-Jan. 2].

W. Lee Burge, president of RCC, also denied the charge that the company maintains a quota system for collecting adverse information. In addition, he said, "In the two and a half years since the Fair Credit Reporting Act became law, my company has produced more than 70 million reports. If, as the FTC said, some 100 consumer complaints out of 70 million reports are the basis for their present action, I wholeheartedly wish they would make better use of their time."

The FTC charged RCC with failing to fully disclose to citizens the data that was in their files; using unfair collection methods; maintaining personal data as well as credit information; and furnishing credit reports to unauthorized sources.

Another RCC official noted that the complaint dealt with medical and insurance files, which are not computerized. An RCC subsidiary, The Credit Bureau, Inc., does maintain computerized data banks, the official acknowledged.

## User Sued for Patent Infringement

(Continued from Page 1)

The language of the patent is so general, it appears Xoma has "really tried to patent double-entry bookkeeping," Cadapso president Norman Williams said, noting with a shrug, "That's been around a long time."

The letters Xoma sent out give no specific details of how the recipient is alleged to have infringed on the patent, Williams said, and seem more intended to see what reaction they can raise without going into details.

Solomon acknowledged that Xoma "has

a number of test cases going... we decided to pick a representative area and go after a number of firms at one time."

Cadapso's Williams and a patent attorney for IBM Canada were among speakers at a special meeting of the Montreal Users Group, made up of large-scale IBM installations, held earlier this month to discuss the Xoma situation. Parts of the patent describe items that have been used for many years and evidence of such use is obviously available, the meeting concluded, while other parts described "methods of doing business" and were therefore not patentable.



## Computer Abuse May Precipitate 'Social Crisis'

By E. Drake Lundell Jr.

Of the CW Staff

MENLO PARK, Calif. — Computer-related crime and computer abuse are not only symptoms of "fundamental cultural conflict and social dislocation," but they might also become "the precipitating cause of a major social crisis."

That is one of the conclusions from "Computer Abuse," the final report of a study into computer-related abuses under a National Science Foundation grant and completed under the direction of Donn B. Parker of Stanford Research Institute here.

Taking computer abuse as a whole and not just illegal acts that use the computer—that is considering all of the "uses of computer systems for antisocial or socially dysfunctional ends"—the report suggests that "a major social crisis could ensue if misuse of computers was to become prevalent."

### Ambivalent Feelings

The report noted that the computer has aroused extremely ambivalent feelings in the public at large, on one hand being hailed as a brilliant achievement and a tool to solve many of our problems, and on the other hand as an "ultimate weapon" to enslave and "eventually destroy us all."

"This ambivalence in the minds of the general public may stem from their sense of 'powerlessness' over the technology. In some ways, computers are still more ethereal than real to the general public, whose only contact with computers is indirect," the report noted.

"The public still finds it almost impossible to conceptualize the impact of computers, let alone to describe and understand it in spite of the fact that we have been experiencing the impact for almost two decades. Moreover, while the impact has already surpassed most of our initial expectations, we are told by experts that the 'computer revolution' has hardly begun."

This ambivalence is "a psychological concomitant of the failure of the social and cultural systems to adapt to the technological innovations that face our society," according to many social scientists, the report said.

But there is a real question, it added, over whether the society and culture should be forced to adapt to technological developments such as the computer or whether the technological development should be molded more to the social structure.

(Continued on Page 6)

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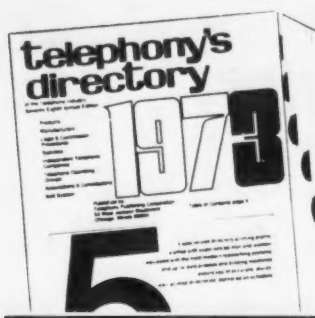
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# Many Ways Available to Secure Operation

DP security is a complex, interactive mix of physical, procedural and data protection, with a healthy amount of backup and audit.

The first three parts of this series gave an overall look at the security responsibilities of both users and vendors and defined the threats to security, while this and future parts analyze in detail the protective measures to minimize security risks.

It is a given fact that computer installations need protection designed into the systems. They need secure operating software. They need integrity checks within the system. They need data management. They need authorization. They need reliability.

They don't have any of these in today's environment. In fact, there are over 760 known integrity holes in IBM's control programs. Any computer professional can get through with a little practice, using a few system utilities.

So we don't have computer systems that are designed from the ground up with protection in mind. There are such systems being designed today, but they won't be available for a few years.

The other choice is to secure operations. It is the only choice for a majority of DP installa-

tions, and is why physical security has received so much attention.

Various means of protection under DP management control can be installed to help mitigate different threats.

To help prevent accidental human errors, access controls to the physical areas of the computer room are needed. Also, if an installation controls traffic to the computer room, the operators can do what they do best, that is operate the computer.

Another important safeguard against an accidental error is to have well-defined, well-thought-out procedures, organized for effectiveness and for separation of controls.

Also important is proper motivation of employees. This is the most elusive and difficult trick of all, but the most important.

### Exercise Recovery Plan

Protection against disaster is self-evident. One can install various preventive measures such as

fire detection, and build strong and flood-proof buildings. If this sort of activity is not enough, and it usually isn't, the installation should develop a comprehensive disaster recovery or contingency plan, and exercise it frequently.

Such a plan should not forget computer documentation. Too many people have had good backup procedures and upon a disaster find their files and programs are safely in an alternate site without documentation or instructions to run the programs. One cannot rely on the memory of the computer operators.

Protection against equipment failure is usually the responsibility of a vendor. A prudent data processing installation will lean on and make sure the vendor applies all the possible preventive maintenance and diagnostic tools that are available.

Overt intrusion refers to the use of the computer to aid in stealing as well as physical theft of hardware or computer-related assets. It can be reduced by access controls, by prosecution and by special protection.

We hear about the need to lock cars and desk drawers. It makes equally good sense to lock up the high value DP assets, namely the tapes and disks.

Sabotage is not the apparent threat it was a few years back.

However, prudent management would probably not want to discount it totally. Perhaps the best approach is to keep in reserve additional security and access control measures for those periods of high risk or threat.

Fraud and sabotage protection are approximately the same. They generally involve access controls, personnel screening, guard patrols and appropriate prosecution if caught. For fraud, an additional mix of protection is important, and much of it involves software access controls and audit.

### Part IV

#### Protective Measures

Covert intrusion can be loosely named after "Watergate technology." The military has long been concerned about the secret listening device and the decipherable emanations of "bugs".

There is a large-scale technocracy devoted to prevention of such problems. It is mostly secret, and concentrated in the national security area. One fallout, the encryption (scrambling) of data has great potential for viable commercial usage.

How much protection is enough? Part V will discuss the major factors which determine how much security is necessary for the individual installation.

Peter Browne is superintendent, DP Executive Office, State Farm Mutual Automobile Insurance Co., Bloomington, Ill.

### Peter Browne On Security



## Computer Abuse May Cause 'Social Crisis'

(Continued from Page 5)

However, with the rapid development of computer systems now under way, the question may be moot, the report noted.

If the rate of change is to be as fast as some have predicted, the report said, "the rate of technological change triggered by the computer revolution will quickly surpass that of all of man's earlier inventions, and societal institutions may be incapable of adjusting to the changes and of exercising control over them to any significant degree."

The public, without direct access to computers, also lags in knowledge because "our educational systems seem to be lagging seriously in informing the public about computers generally," the report added, noting that even professionals in the field have a difficult if not impossible time keeping up with the developments.

"In the past, inventions such as the printing press, the steam en-

gine, or the harnessing of nuclear energy did not induce a pace of technological change that was overwhelming," as is possible in the future of the computer revolution, even though society so far seems to be adapting.

"Whatever our image of a future brought about by the computer revolution may be, it cannot be too optimistic, assuming that it is more the rate of technological change than its substance that is critical in the adjustment process," the report said.

"The computer experts say the pace of the computer revolution will leave most of us gasping. On the other hand, we are also totally ignorant of what the unintended, indirect consequences of the new revolution might be. Yet it is often the unintended and indirect effects, rather than the intended and direct consequences that ultimately have the most profound and pervasive impact on society," the report continued.

The report noted that in the past there have been several cases where technological development has caused a severe backlash from the public and that "such crises generally result in the breakdown of social order immediately surrounding the technology and incite demands of immediate transformation of the entire local situation."

"Now mass communications can make a national crisis out of otherwise local ones," the report warned.

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## Editorials

### Patent Problems

Congress certainly has other things on its mind besides the software patent issue, but users must try to focus new attention on this problem.

The uncertainty surrounding existing patents was highlighted last fall when a Canadian company announced it would begin enforcing its new patent. More recently, the company filed a suit against McGill University, one of the major educational users in Canada.

U.S. patent laws generally parallel those north of the border, and it is reasonable to expect similar action here in the states by the same company or another in the software sector.

The cost of litigation (for both sides) and the generally accepted inadequacy of existing laws should be enough to prod users into demanding a resolution of this problem.

Once again, an interdisciplinary effort among computer scientists, managers, lawyers and marketing people is needed to combat government inertia.

### Will the Public 'Cope'?

Some of the drawbacks of Electronic Funds Transfer Systems are apparently eliminated by Bill Check, one facet of a project under way in Georgia.

Sponsored by the Committee on Paperless Entries (Cope), Bill Check gives the consumer the option of timing his payments to utilities, for example.

The consumer simply signs the bill and, at his discretion, mails the signed bill to the utility. Then, the company and the bank work out automatic deductions from the consumer's account.

Cope also has the socially acceptable goal of reducing paper usage.

The degree of acceptance by Georgia consumers and the degree of convenience they might experience, as well as possible problems, will make a good benchmark by which we can measure future progress of EFTS.



'Dry Your Tears -- I Was Going to Plug It in All Along!'

## Letters to the Editor

### ...By Any Other Name

I read with interest Jarrell C. Grout's provocative article "A New Name for DP Profession" [CW, Dec. 26/Jan. 2]. I feel professionally obligated to draw contrast to the thought pattern which Grout articulates and which has emerged among much contemporary DP thinking.

It has been predicted by theorists in the computing field that

large numbers of people will be unable to understand the age of automation for what it really is. The prediction has come true. Persistent attempts to interpret automata theory have reverted to describing it in the light of the age of the industrial revolution, which at best falls short of the true nature of computing work.

Much computing work starts with a desired effect which must be created by inventing causal factors. We start with the effect and create the cause! The age of automation has reversed "cause and effect," and has thereby dramatically revealed the long hidden and secret process of invention. This may prove to be the single most important academic discovery of the embryonic age of computing. This discovery may have begun the precipitation of a snowfall of information revelations and inventions unmatched in the annals of mankind. But that aside, the point is that much computing work is very much akin to the work of the inventor.

It is becoming increasingly recognized that the inventive force that permeates automata is having corrosive effects on the specialties. Automata is forcing the evolution of occupations which are complex roles. The trend is clearly toward more occupations in which men are paid to learn, to invent, to define ultimate effects and to synthesize results.

Calling a man who works with automata by any designation which implies specialty seems to run counter to the deeper philosophy of the profession. The true computer professional assumes a complex role. Computing work to him is a way of thinking and a way of working with perception and information. A specialist designation for a man who plays a complex role is inappropriate and misleading.

In short, a DP professional is not a specialist in the same context as a specialist of the age of the industrial revolution. We work with information. And the means we use for working with information do not change as

we freely cross the borders of all the specialties.

I fancy the name "cybernetics" which comes from the Greek word meaning steersman. The term was first used by one of the fathers of the computing field. It finds ample support among those who study control and communication in animals, machines and abstract entities.

Such a name promises to have a far longer useful life than terms like "Computer Information Processing," "Data Processing," or the like. Furthermore, it encompasses more than mechanical information processing. It includes pattern recognition, learning, extensions of thought, robotic studies, automata theory and sequential machines. And it implies a level of knowledge that penetrates associated studies.

Michael E. Zeidler

Computer Related Services  
Milwaukee, Wis.

"Cybernetics" has come to be rather closely associated with feedback and control. Don Michael suggested "cybernation" about 10 years back. Our European friends prefer "informatics." HG

### We Can Count on IBM

I would like to give one example of why IBM is, and will remain, number one in the computer industry.

In September 1973, our company entered into negotiations with Control Data Corp. for a replacement to our 1403 printer. (CDC is advertising this plug-to-plug replacement). After a proposal was presented by CDC, we signed their contract and begun making plans for the installation in March. Ninety days after we signed the contract, we were told by CDC they could not complete the contract because it was unprofitable.

Needless to say, we will install an IBM 1403-N1 printer at a premium price but with a company we can count on.

Harry T. Parrish  
Manager

Information Services  
Carolina Steel Corp.  
Greensboro, N.C.

## Standards Warfare

National Cash has supported computer and office machine standards more completely, in proportion to its DP involvement at least, than any other mainframe outfit — more even than IBM. Corporate officials have chaired many domestic and international standards meetings, senior technical figures like Dick Mindlin have contributed heavily and continuously to X3 activities, money and time for engineering and paper work have been provided quite generously.

But when the chips are down (wonderfully apposite nowadays, that old phrase!), all this presumed corporate commitment disappears under marketing pressure. Standards becomes just another battlefield on which the combatant competitors struggle and the local peasantry, the DP customers, get trampled.

The recent National Retail Merchants Association meeting provided the proscenium for such a drama. Behind the curtain, muffled shouts and the thumps of scenery falling indicated to the startled audience a certain, ah, lack of cooperation among the stagehands. Out front, a glamorous announcement of the new NCR marking code, proprietary and completely non-standard, was somewhat diminished by the hubbub.

At the same meeting, optical character reading was attacked and defended, with IBM supporters and NRMA staff claiming "too soon," "now ready," "too difficult," "not compact enough," "the housewife won't read it," "the housewife doesn't need to," and so on. Great stuff to argue about after the second martini!

If every can of grapefruit sections and every package of Jockey shorts is going to be coded at the factory, if every big supermarket worldwide is ultimately to have orientation-insensitive optical or magnetic or olfactory sensing, if consumer preferences and interests are to be protected, if good new technology is to be introduced, if good old technology is to be conserved, and if systems purchasers are not to

be ripped off (ah there, Tradar!), the trade and standards associations are vitally needed. Lip service by the industry boys, followed by open and contemptuous disregard of the very standards they helped establish, is just shameful.

There is a very simple but almost certainly unrealizable punishment: the standards organizations ought to censure and, in really egregious cases, expel the representatives of offending companies from appropriate subcommittees and committees. Please note carefully that I am talking about doublecrosses, not disagreement: if an outfit works for bar codes, or OCR-A lower case, or hexagonal knobs on typewriter platens, and is outvoted, it is and ought to be free to fight other battles. And, since the whole idea of standards in the U.S. and in most Western countries revolves around voluntary compliance, an outvoted company can still design, announce, sell and support its pet device.

What ought to be penalized, I repeat, is treachery: contributing to a standard, voting for it, and then grinding it underfoot. Sure, the technical man is often completely innocent, and always powerless: the decision on System/3 or color-coding is made upstairs. But for the offending corporation, censure or expulsion of its representative, with attendant publicity in CW and many other places, drawn to customers' attention by the competitor's salesman — well, it may hurt. It should!



Herb Groch



## Letters to the Editor

### DP Director Unrecognized And His Salary Reflects It

The article about the salaries of EDP directors and their rankings in various types of organizations compared with other department heads (such as sales, finance, etc.) [CW, Nov. 21], was somewhat misleading regarding the potential and the future of data processing as a viable and growth career. While it is probably true that the incumbent EDP directors are, on average, close to the bottom in salary, it is probably also true that they are reasonably compensated and not really underpaid at all.

In determining compensation, a number of factors are considered (whether appropriate or not, each plays a significant role in determining salary and relative importance of a position in an organization): budget under direct control of the manager; the manager's contribution to profit; return on investment achieved by the function; intangible "contribution to the company" as perceived by top management; years of service the manager has with the company; manager's age; the amount of attention top management must give the function ("aggravation coefficient"); and other general performance factors.

If the above are, in fact, criteria applied to the determination of compensation, the EDP director is likely to be reasonably low on the totem pole of middle managers. His budget, while large, is seldom more than one percent of sales. In a manufacturing organization, the purchasing budget is many times that amount. In many companies the advertising budget is much larger.

EDP is usually looked upon as a cost center: it is not perceived as a contributor to company profit. Few organizations

measure return on investment of EDP, though it is certainly appropriate to do so.

As for intangible "contributions to the company," we all know EDP is most frequently perceived as a necessary evil to be endured, not cherished. EDP directors are not known for longevity in their jobs. And many top managements do not care to spend the time necessary to understand what data processing is all about (and it really is not any less understandable than engineering which they usually do understand) and hence view it as an aggravation demanding more of their attention than they care to give considering that it consumes only one percent of sales.

Until the true potential of EDP is recognized by top management, and perhaps the primary duty of the EDP director at this time is to work toward that recognition, the director's salary will continue to reflect the ambivalent attitudes of senior executives toward EDP. It is up to all of us, at every level, to change those attitudes.

A.C. Patterson  
Senior Consultant

The Diebold Group, Inc.  
New York, N.Y.

### Federal Control to Blame For Current Energy Crisis

Your "Carnival of Greed" column [CW, Nov. 28], Dr. Grosch, refers to the "energy crisis" as "... clearly a greedy conspiracy (on the part of) oil and automobile companies, and the utilities," and on the opposite page you belittle Birchite opinion which essentially predicates just this sort of conspiracy (you also equate Birchite opinion with libertarian philosophy, which is quite revealing of your biases, but be that as it may be).

Many knowledgeable people have seen this oil problem coming down the pike

for quite some time, and they have not been shy about saying so. The fun and games in the Middle East may have hastened the moment of truth a bit, but it was coming anyway, and soon.

The reasons for this phenomenon are quite complex, and not at all explainable by the pseudo-populist bit of simplistic scapegoat-seeking you wrote as an editorial.

In brief, the components of the problem are: price controls, regulation of the oil industry, regulation of the shipping industry and the extremist fringe of the ecology biz (those who are anti-people, rather than "pro" a harmonious relationship between man and the rest of the planet).

Excepting the last item, the common denominator is government control. Big businesses in this nation are controlled by the "Feds," and normally have to obtain approval from one or more agencies, councils, bureaus, authorities, or whatever, before making any major decision.

Since, on Page 9 of the Nov. 28 issue, you indicate approval of this state of affairs, I find it rather disingenuous of you, on the preceding page, to attempt to place the blame other than where it so obviously belongs — the federal bureaucracy.

Be as wrong and as biased as you please, but please try to be consistent.

John M. Flint

Honolulu, Hawaii

I wrote "Carnival of Greed" on Nov. 18. A great many new viewpoints have since been expressed in the media, and are available to CW readers. Unless something really novel is submitted, the correspondence is closed. HG

### The Libertarian View

In answer to the editorial question in Letters to the Editor, Nov. 28, regarding printing of "right wing" comment:

The direct answer to that question in a society which as yet has not suppressed free private publishing is, of course, print what you want — it's your paper and you pay the bills!

However, consider that *Computerworld's* popularity is due in no small part to its venturing into closely related topics beyond strictly technical aspects of data processing — and with some degree of sophistication. Completely suppressing a large segment of reader opinion is certainly going to alienate that readership, and there isn't much to be gained from talking only to those who agree with you.

[There is] a large segment of libertarian opinion quite different from the traditional conservative right wing: a social philosophy that has become increasingly popular among DP types.

Michael E. Anzies

Honolulu, Hawaii

### Name Is Not the Same

This letter is in reference to my article which appeared in the Dec. 26, 1973/Jan. 2, 1974 issue of *Computerworld*.

The title of the article I submitted was "The Profession of Computer Information Processing," not "A New Name for DP Profession!" Through your editing — especially your title changing — I believe the article expresses something quite different than I had intended.

My intent was to suggest a name for our profession — not a new name for the DP profession — and then explain why that name should be used. In its original form, I believe the article accomplished my purpose. Unfortunately, in its published form I doubt that it accomplished much at all.

Jarrell C. Grout

Department of Computer Science  
Stephen F. Austin State University  
Nacogdoches, Texas

## '74 Bringing Hardware Advances Without Software Disturbances

Computer people have been accustomed, to seeing many good pieces of hardware become effectively unusable because of the lack of software support. The individual computer installation rarely has the knowledge to build software support for a piece of hardware, even when it is financially prepared to do so. The hardware specifications are either not available, or if they are available are simply not precise enough to permit the building of proper software.

As a result, the ability to control the development of software has been used to

control the development, or marketing, of hardware. A new piece of hardware stood little chance of being accepted unless there was substantial software support for it.

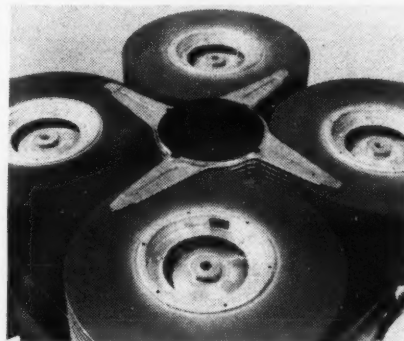
Actually then, the procession of advances in hardware meant first the development of the hardware, followed at some indefinite time by the development of the software. Then at some much later period came the introduction of applications which utilized the newly developed software.

The power of this process in holding up the development of technically feasible hardware was well illustrated in 1972 in the upper echelons of IBM. The matter under discussion was the timing of the development of what are called "electronic memories" to replace the current generations of disk systems, or rotating memories. The timing of this replacement was then put at the end of the 1970s, and the reason given for this delay was the unavailability of software for it.

Naturally software does not get developed until there is a market to pay for the development. Equally naturally, markets do not appear until there is some guarantee the equipment will be brought into use.

Now, however, Storage Technology Corp. (STC) — one of the few American computer firms which, while recognizing the strengths of IBM, has shown an unusual capacity for finding profitable places for new technology — has broken through this barrier. STC has taken a

### The Taylor Report By Alan Taylor, CDP



The user of the new drives sees a novel arrangement of four fixed disks all being approached from a single central position. The disks themselves are larger than current disks and are only removed for maintenance purposes.

new-style piece of hardware and made it available to users, not just as a supported system, but as one which is supported with a software interface identical to the functional interface users are already familiar with. This is a new approach.

Curiously enough, the area comes in the exact functional area that the IBM planners quoted alone were talking about in 1972 — the disk area. STC has taken the software interface currently developed for user application programs and made it operate to access records and files from the new-style 4-spindle disks it developed.

Mechanically the advance the STC disks provide is the use of a much lighter read/write head, and, as a result, they have arms with lower inertia (see picture). This permits a reduction in the cost to store billions of characters that STC believes is sufficiently abrupt that it can abandon the idea of requiring that the disks be removable by the user — and so obtain even greater economy through the use of sealed-in systems. Certainly it is a technical change that adds a new card to the user's hand.

The marketing breakthrough has come through the provision of a software package designed to permit programs using



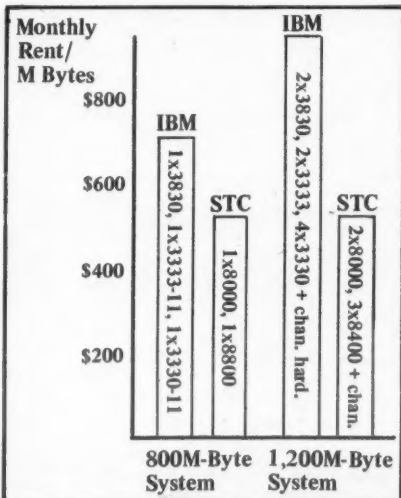
The key element in the breakthrough is probably the development of a much lighter read/write head. The STC head, which weighs about one-eighth — to which it is being compared here — can be controlled much easier, thus leading to a large reduction in complexity.

today's disk access routines to operate, without change, on the new-type disks. Progress here is strong, and a demonstration of this facility is scheduled for late this month.

Perhaps it will be ready, perhaps it will not. I have sufficient faith in the quality of the work produced by STC in the past to believe if it is not ready this month, it certainly will be next, and a breakthrough is a breakthrough even if it does come a month late.

What does this mean for users in general? As I see it, it's yet another breach in the dam that says that having selected one hardware vendor, you get landed with a product that is either his, or carbon copies of his. The cost of storage can come way down, and the possibility of technical breakthroughs becoming marketing breakthroughs, even though they are not being invented or marketed by the great hardware vendors, is greatly increased. To the user's benefit.

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The chart compares two monthly rental/Mbytes of the IBM and STC offerings. The two items, taken from the middle of the STC range show STC prices are around half the IBM ones — a price drop that would not be expected from "me-too" engineering which is what the lack of useful software interfaces has restricted users to in the past.

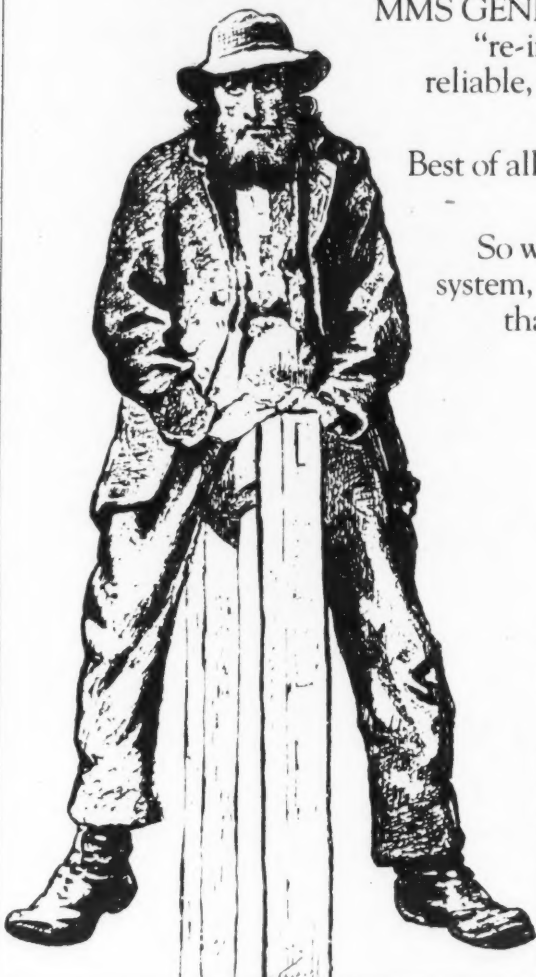


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## Letters to the Editor

### 'Stern Perfection Is the Greatest Art'

In response to the Dec. 26-Jan. 2 Taylor Report:

Computer output is unreliable only when the program designer has failed to properly perceive (or conceive of) the application in the first place. If one initially maps a model providing for all the dimensions, including conditionality, pertaining to the application, the problem of unreliable output cannot arise.

If the software used in the school grade example was being applied to more than one school and the "meaning" of grade codes 1-4 was correct for one or more schools, clearly the condition of a particular school was not included as a dimension in the application model. If the "meaning" of the grade codes applied to no school, the definitions of the codes in the model were patently erroneous.

The fault lies at the perceptual/conceptual level, and ultimately the DP center must take responsibility for the error. We need not so much an "August Data Processing Code or Conduct Committee" as we need increased perceptual/conceptual skills and a means (tool) for expressing dimensions, including conditions, and unambiguous definitions.

Velma B. Fahrner

W. Hollywood, Calif.

### Ethics and Size Don't Mix

In *Computerworld's* rejoicing over the government's decision in the IBM-Telex suit, I saw little mention of the possible adverse effects it might have on IBM's customers. The recently received notification of price increases speaks for itself.

Being a mini user and thus a world apart from penalty clauses on FTPs and "mid-life kickers," I am not rejoicing over sharing IBM's costs of doing business with the larger user. Nor do I share CW's anti-IBM bias.

However, I think *Fortune's* article best interpreted the judge's viewpoint: business decisions that are seemingly *unethical* rather than *illegal* are OK only if you're not too big.

IBM's competitors and critics would do well to consider a basic economic fact of life: any product (a plug-compatible device that's easy to market) or service (an FTP without a penalty clause) that costs more will sell for more.

John S. Munro

Address Unknown

*Computerworld* welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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## How One Company Went to VS — Part I

# Decision Based Largely on Month-End Throughput Need

By Samuel J. Shields

Special to Computerworld

PHILADELPHIA, Pa. — Many managers today are asking whether they should go to virtual storage. SmithKline Corp. faced this question about a year ago. Past history had proven SmithKline had a good record in selecting software, so we did not want to fail now. We had to find a way of increasing throughput at month-end. We had a large amount of printing as well as file updates to be done. But we did not want to increase our hardware only for peak periods. It seemed we had

operational and scheduling problems as we had to go from OS to stand-alone and back to OS.

Soon we outgrew the one Model 40 and added a second. This helped the workload but now two systems had to be maintained and generated since one had 256K and the other 128K, and the peripherals were not identical.

After a money crunch, it was decided to go with third-party leasing companies to get a 360/50 to replace the two 40s. The Model 30 remained as an off-line printer and utility machine.

The 360/50 ran under OS/MFT, with no changes to any JCL or programs.

COS was used to run the 1410 programs, but at times it used the entire machine since 80K was being emulated and the machine was only 256K. Once again we had scheduling problems, but we did not have to re-IPL now. It was then decided a 370/145 with 384K would be installed.

The 370 would offer us greater throughput, since we could now operate with three partitions. We also expected to eliminate our overtime expenses on the weekends.

The change from one system to the other had to be done in December [1972] because of contract agreements, but from an operations standpoint that timing was dangerous. The end-of-month, end-of-quarter and end-of-year work all had to be done.

IBM suggested it would take about 36 hours to remove the Model 50 and connect and check out the 370. If everything went smoothly we would be able to make our scheduling deadline. In a service-oriented department, failure to meet the schedule would not have been acceptable.

We contacted many other users with similar systems and made arrangements for emergency backup. Operators were scheduled for the entire weekend. A Pert system was used to control every problem area we could think of.

Disassembly of the Model 50 started about 10:00 a.m. Thursday. IBM had two shifts of 12 hours each with two men to a shift working on the installation. It appeared they were efficient on the installation but the problems, if any, would not show up until diagnostics were run.

IBM ran its tests Friday afternoon; finally at 4:00 p.m. they turned the system over to us for our software systems tests. After three hours of copying libraries and catalogs, the system ran its first production job without any problems.

The 1410 emulator failed but this was caused by a small problem in the system generation and a regen took care of it. By midnight, just 38 hours after shutdown, the system was in full production with three problem partitions of 92K each and

(Continued on Page 12)

## User Casebook

enough hardware if we could increase our core storage.

### History

Some history of how our data processing area has grown is in order. In 1967, after having other computers, we chose to upgrade to a 360/40 for most processing with a 360/30 to run the old 1401 jobs and to spool card-to-tape or tape-to-printer jobs because MFT with spooling was not yet available. The Model 30 would run stand-alone under BPS.

After many studies and evaluations, OS PCP (Primary Control Program) was chosen for the Model 40. Elaborate standards were set up, most of which are still valid today, to give guidelines to all systems being developed. Many of the programs that would run on the new system were 1410 emulation programs.

The 1410 stand-alone emulator was used for these jobs. This caused many

## Verbs, Program Shell-Building Ease Cobol Coding With 'CL\*IV'

CANOGA PARK, Calif. — Cobol-oriented 360/370 installations operating under either OS or DOS can gain significant support in developing and maintaining application programs with the CL\*IV program logic generator from Informatics, Inc.

The package, scheduled for release next month, combines the features of various "pre-compilers" previously available with some that appear to be unique. The result is that the Cobol programmer is able to work in a familiar environment but with more efficiency.

As with older aids, for example, CL\*IV creates most of the preliminary portions of a Cobol program — Identification through Data Divisions — through simple, parameter-driven entries. Some of those entries also trigger the generation of file and field matching logic that becomes the shell for the user's Procedure Division.

The package also supports the use of

"shorthand" abbreviations to reduce coding efforts even more, but perhaps more significantly it produces ANS Cobol source code in a standardized format and sequence of steps so that maintenance should be sharply reduced as well.

### New Verbs Added

CL\*IV uses standard Cobol coding sheets so that programmers need not feel they have to learn a new language, but it supports three new verbs to extend the capabilities of Cobol without getting into the complexities of macro support, which Informatics feels most programmers cannot use effectively.

Since much of Cobol programming is devoted to report generation, CL\*IV couples a PRINT verb that handles all the coding needed to build a print-line field-by-field in Working Storage or the Output file area, and a sample report feature that dummies the proposed output even before the program is completely written or data files have been collected.

The other verbs, Informatics noted, are INITIALIZE, to insure that all cited fields, records or arrays have the expected values in them at the start of processing, and COPYH, which saves the recoding of CL\*IV functions in the same way the standard COPY verb saves recoding of standard Cobol functions previously catalogued.

The source code generated by CL\*IV has been found, by Beta test sites, to be generally a bit more efficient in core requirements and execution speed than hand-coded Cobol, though this would vary from program to program.

The package itself is written in ANS Cobol for ease of maintenance and requires 86K of core under DOS or 120K bytes under OS. It utilizes 17 tracks or approximately one cylinder of disk space, Informatics added.

CL\*IV is sold with documentation, training and maintenance and is priced at \$20,000.

Informatics is at 21050 Vanowen St., 91304.

## Cobol Clinic

# Equal Lengths Simplify Non-Numeric Comparisons

By Kenneth Seidel

Special to Computerworld

Although it is convenient to write statements such as:

IF PART-NUMBER = SPACES GO TO 800-NO-NUM

there is an inefficiency hidden in such statements.

Presumably, PART-NUMBER is a 15-character field, so this comparison will test 15 characters versus one SPACE followed by an extension of fourteen additional spaces. Unfortunately, the object code goes about it in two steps, and is not nearly as efficient as would be the code employing equi-length items:

IF PART-NUMBER = BLANK-15 GO TO 800-NO-NUM

The latter code makes use of an area in Working-Storage defined as follows:

01 BLANK-16.

02 FILLER PIC X VALUE SPACE.

02 BLANK-15.

03 FILLER PIC X VALUE SPACE.

03 BLANK-14.

04 FILLER PIC X ...

•

•

•

15 BLANK-2.

16 FILLER PIC XX VALUE SPACE.

Observe that the group item BLANK-16 contains subitems useful in testing any item of length two through 15 against a specific number of SPACES, enabling more efficient testing sequences to be generated in the object code.

Similar remarks apply when you write comparisons against literals; be sure that the literal (enclosed in quotes) is of exactly the correct length, i.e., equal to the length of the field tested.

### Packed Decimal Fields

For business data processing, packed decimal (Comp-3 in ANS Cobol) is the most efficient data mode, in terms of both computation (CPU main storage) and recording in files (because it is more compact than "zoned" external decimal, which has Display usage).

Failure to designate numeric fields as packed items when designing file structures forces a degree of inefficiency on all the programs that handle the file. Too often new systems are designed around external decimal field definitions, simply out

(Continued on Page 12)

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## Special Care Needed to Control Packed Data, 'Strange' Output

(Continued from Page 11)

of habit or fear of change. So, whenever you can, convert decimal fields to packed representation.

Even though one may be faced with existing fields predefined as external decimal for a given application, there is no excuse for forgetting to use packed representation in derivative control totals, "buckets," and accumulations for sub-totals.

There are always two good rules to remember when using packed decimal data:

(1) Define an odd number of digits.

(2) Put S at front of the picture.

Omission of S causes "fix-up" code to be generated, designed to assure positive data results only. If the number of digits is not odd, then there will be "fix-up" code designed to guarantee that the digit position leftmost in the storage reserved for the item always contains zero. (To the right of this zero, there is an even number

of digits, followed by the sign representation.)

### Strange Characters

Sometimes the Cobol programmer must handle a byte containing an unusual code, such as hexadecimal "1C."

Suppose the value 1C is to be replaced, if it exists in a fixed position, by an asterisk. There are several methods that

### Cobol Clinic

The Cobol Clinic is intended to serve as a clearinghouse of ideas to make user programs more efficient. Reactions to Seidel's proposals are welcome, as are descriptions of other areas readers have found to be critical to their own coding effectiveness. Reports of optimizing efforts would be of interest.

come to mind:

(a) EXAMINE replacing

(b) TRANSFORM

(c) Comparison

Recall that we said that the strange character's appearance would be in a fixed position. Therefore, neither TRANSFORM nor EXAMINE is indicated, for we can deal directly with the byte:

```
IF MAY-BE-1C-BYTE = HEX1C
MOVE '*' TO MAY-BE-1C-BYTE.
```

where HEX1C is defined in any of the following fashions:

```
(a) 03 BINARY PIC S99 VALUE 28
    COMP SYNC.
```

```
03 FILLER REDEFINES BINARY.
    05 FILLER PIC X.
    05 HEX1C PIC X.
```

```
(b) 77 HEX1C PIC X VALUE 'Ψ'.
```

Where Ψ is multi-punched 11-4-8-9, a comment card (\* in C.C.7, ANS) should precede the level 77 item by way of explanation since the literal character is not representable on the printed listing.

Note that these methods all presuppose a clear understanding of the Ebcidic code and the internal forms for packed and binary numeric representations.

Incidentally, if the location of this possible funny character were not fixed within a large field, TRANSFORM would be more efficient than EXAMINE to change any 'Ψ' to '\*' for items of length 17 or more.

Kenneth Seidel is an independent DP consultant from Fallsbrook, Calif.

## How Firm Went to VS

(Continued from Page 11)

one writer partition of 14K.

The system performed so well and the throughput was so good, most of the extra shifts and all backup installations were cancelled. The only operational problem we still had was the 1410 and large core jobs. Both took two partitions to run, leaving only one partition for other work. End-of-month processing was still very tight; and necessitated overtime to process the work, and to print the reports from a print tape on the Model 30.

In Part II, Shiels describes the actual changeover to VS1 Release 2.0, and the implications of the new environment for the programmer and operations staffs.

Samuel Shiels is systems support coordinator at SmithKline Corp., Philadelphia, Pa.

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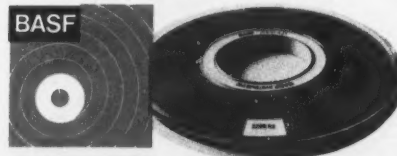
What does matter is narrowing your margin of possible error. And the easiest place to start is in your selection of computer tape. How? By specifying BASF.

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We can make this offer because of the unique capabilities of the VCI scheduling and accounting system — a wide ranging family of administrative computer control programs designed to get more out of a computer system. What it does, in effect, is use a computer to drive a computer. To get better control. Improved scheduling. And much greater throughput.

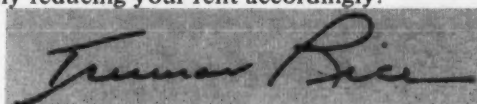
The purchase price of the VCI package itself ranges from \$11,000 to \$16,000, depending on your operating system. So when you consider what it can do for you, you'll understand the use of the word Value in its name.

Alternate means for gaining 25% increase in throughput	Approximate additional annual cost
Upgrade from 360/40 to 360/50	\$50,000
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With the VCI package, however, you get the same thing. But without the increased expense. And without the trouble of having to upgrade your entire system.

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Mail to: Mr. Truman Rice—President, Talcott Computer Leasing Division, 1290 Avenue of the Americas, New York, N.Y. 10019

## VCI package just the tip of the Talcott savings iceberg.

The VCI scheduler and accounting system is just one of the reasons for leasing your IBM 360 equipment from Talcott.

For openers, you save a lot of money on your monthly lease rates.

Here's a typical example based on a 360/40 in a 256K configuration with a 2314 disk, an I/O control unit, a line printer and a card read/punch.

Lease term	Monthly charge		Total term of contract charges		Contract savings Talcott vs. IBM MAC*
	IBM MAC*	Talcott	IBM MAC*	Talcott	
1 yr.	\$18,722	\$11,265	\$225,264	\$135,180	\$90,084
2 yrs.	\$18,722	\$10,260	\$450,528	\$246,240	\$204,288
3 yrs.	\$18,772	\$9,560	\$675,792	\$344,160	\$331,632

\*Maintenance charges excluded from MAC.

The Talcott monthly lease rates quoted here include "all-risk" insurance for the duration of the lease, and permit unlimited system usage. Indeed, they even include the VCI scheduler and accounting system, *installed and operating*.

**Lots of reasons to lease from Talcott.**

Another important reason for leasing from Talcott is that you get what you want. Under the terms you want. And for the period you want.

Remember, too, that you'll save energy by using less power and air conditioning with a 360 instead of a 370.

And when you lease a 360 from Talcott, you not only get rental savings that can amount to hundreds of thousands of dollars, but you also get at least 25% more throughput from your Talcott 360 than you can get from anybody else's. Including IBM.

Guaranteed.

**Talcott Computer Leasing**



# COMMUNICATIONS

## Data Briefs

### AT&T's 'Hi-Lo' Rate Grounded Until April

WASHINGTON, D.C. — The FCC has suspended for 90 days the AT&T high/low private-line tariff proposal that would lower rates on high-density routes and raise rates on less heavily used routes.

The commission said "substantial questions of lawfulness" were raised by the proposed tariffs. The new rates were suspended until April 14. One of the questions still pending, according to the FCC, is whether the proposed rates affect the commission's policy of requiring full and fair competition between the existing and new specialized common carriers. No date has yet been set for hearings, an FCC staff spokesman said.

### Display Replaces IBM 3277

HOUSTON, Texas — Texas Scientific Corp. has a plug-compatible replacement for the IBM 3277 display station.

Called the E 200 series, the units can be connected to either the IBM 3271 or 3272 control units using the same coaxial cable as the IBM 3277, the firm stated.

The E 200 units offer a home key which causes the cursor to return to the first character position of the screen; automatic variable initialization which marks spaces for variable data with dots; a repeat key; a blinking cursor; and a 10-key adder pad, according to a spokesman.

The E 200 costs \$4,000, or about \$1,000 less than the IBM 3277, the spokesman said.

Deliveries are set for April from the firm at 8000 Harwin Drive, 77036.

### Modem Meets European Standards

NEWTON, Mass. — Codex Corp. has brought out a 4,800 bit/sec modem designed to comply with the international CCITT recommendation V.27.

The 4800I also uses eight-phase modulation, which Codex feels is more suitable for European conditions.

The modem's diagnostics include local loop-back, and DC and audio bus-back. Remote loop-back, optional voice/data, built-in multiplexer, secondary channel and built-in eye-pattern generator are optional.

The modem also has an automatic adaptive equalizer for steadying performance over changing line conditions.

The modem has three strap-selectable operating modes: compatible mode, which is compatible with all other CCITT V.27 units; the automatic mode, which employs the equalizer; and the backup mode, which permits operations on lines not meeting M102 (3002) specifications.

The Model 4800I costs \$4,800, with first deliveries in the spring from the firm at 15 Riverdale Ave., 02195.

## Trend to Specialized Terminals

# IBM 3790 System Signals End of an Era

By Ronald A. Frank  
Of the CW Staff

As IBM continues to announce communications systems tailored for use with specialized controllers or concentrators, it is becoming clear that the days of the general-purpose terminal are gone — at least within the IBM family of products. The latest terminal system to be intro-

## Analysis

duced is the 3790 and it sets a very interesting precedent in the IBM product hierarchy. IBM has taken previously available terminal equipment, added a specialized controller called the 3791, and told users that the result is a 3790 system.

But where does this system fit? Despite opinions to the contrary, the 3790 is more of a communications system than a data entry system. While it does allow a certain amount of local processing at a remote site, the 3790 depends on a 370 mainframe for its software. In fact, all 3790 programs are compiled at a central 370 mainframe before they are transmitted to the remote site. Certainly the IBM 3740 data entry system has no such close ties to a 370.

It is obvious that IBM intends to offer terminal systems for specific applications and oriented around microcoded controllers or concentrators. These controllers will transmit data to a 370X front end at the central site using SDLC. Most probably each of these controllers will format its SDLC data in a slightly different way so that replacement of an IBM controller will be limited to the application. This means it will no longer be possible to replace a 270X with a plug-

compatible equivalent that runs in 270X emulation. Instead the user will have to replace his 3790, or finance, or retail or supermarket controller with a box that does exactly the same work.

And this type of equipment replacement makes it much harder for the user to save money with non-IBM units.

As each communications subsystem consisting of a controller and a group of terminals is interfaced with the mainframe, specialized teleprocessing software will further lock in the user. This software environment is slowly being unfolded by IBM but it seems certain it will be geared to virtual storage mainframes and SDLC line protocol.

To illustrate how communications subsystems will be dependent on their 370 connections, IBM has described its Program Validation Services (PVS) and Subsystem Support Services (SSS) for the 3790. PVS allows the testing of 3790 programs at the host before "error-free" programs are installed at remote locations where the 3790 is operating. PVS also formats the programs for storage at the host and for later transmission through a

370X front end.

SSS controls 3790 program libraries again at the 370 and also controls the transmission of the programs using Vtam/NCP. Presumably this will require interaction with the 370X. It appears that much of these Vtam/NCP questions will be answered early next year. The latest VS operating system release dates, announced with the 3790, are DOS/VS, March 1975; OS/VS1, May 1975; and OS/VS2, March 1975.

The main conclusion for the communications user is that terminal equipment, according to the world of IBM, is changing. It is true that the 3790 system can support 2741 terminals but that seems to be more of a concession than a primary type of 3790 support. In order to use a 2741, the user must first have a 3792 auxiliary control unit which in turn communicates with a 3791 controller.

As more dedicated communications subsystems are introduced for specific applications, it becomes evident that the days of the 3735 programmable terminal and the relatively simple communications environment it represented are fast fading.

## Analyzer Tests Voice Channels, Displays Results in Two Minutes

PALO ALTO, Calif. — Hewlett-Packard has come out with a data transmission parameter analyzer that uses a minicomputer to evaluate voice-band channels for data transmission in less than two minutes, according to the firm.

The Model 5453A is operated from an interactive CRT terminal. Measurements are taken automatically and the results

analyzed and stored if needed.

The measurements are made digitally with minicomputer-generated test signals and computer-based signal analysis.

The analyzer automatically measures nine major voice-band parameters: 1-kHz loss, attenuation distortion, envelope delay distortion, non-linear distortion, phase jitter, message circuit noise, C-notched noise, single-tone interference and frequency shift.

Results are spelled out on the CRT, and may be printed or stored on disk.

The Model 5453A costs \$56,000, including installation and check-out of the system and on-site operator training.

Delivery begins in February from the firm at 1501 Page Mill Road, 94304.

## ABA Bank Card Standards Group Sets Six EFTS Projects for 1974

WASHINGTON, D.C. — The Bank Card Standards Committee of the Bank Card Division, American Bankers Association (ABA), has announced six projects related to electronic funds transfer for the year ahead:

- Evaluation of the current bank card magnetic stripe specification in light of the developments in attended and unattended banking terminals and the introduction of the "cash" card.

- Continuation of work on the development of specifications for a standard interchange communication transaction message.

- Development of a security specification regarding the physical makeup of the card, the encoded data contained on

the card, the magnetic stripe and the communication of transaction data.

- Continuation of development of definitive durability specifications for the bank card.

- Investigation and evaluation of methods for personal identification of bank card holders.

- Improvement of content and format of the bank card standards manual.

Committee chairman Perry E. Hudson Jr., vice-president, Chase Manhattan Bank, also noted his panel has approved and sent to its membership for approval two working papers: required data for descriptive billing of a bank card transaction, and specifications for machine-generated sales drafts.

## Packet Net Okayed

ENGLEWOOD, N.J. — The Federal Communications Commission has approved the application of Graphnet Systems, Inc., to build a nationwide, computerized facsimile and data-to-facsimile communications system.

As authorized by the FCC, Graphnet's system will utilize packet-switched store-and-forward techniques employing leased common carrier facilities.

Graphnet Systems is a subsidiary of Graphic Scanning Corp.

## The 8040. Away from your HQ add more IQ.

Sanders' intelligent 8040 Remote Batch Terminal System can reduce your dependence on your central computer for processing of remote-site data. A single-terminal data collection system using cassette storage, it can perform computer functions (data validation, editing, arithmetic and error-checking) at the point of data entry. It gives you source-document screen formatting and it eliminates the need for special operators. It's another reason why Sanders leads the industry in distributed data processing systems technology. Sanders Data Systems, Inc., Daniel Webster Highway-South, Nashua, N.H. 03060. Call (603) 885-3727.



### Sanders...the intelligent answer

European Sales Offices: Sanders Data Systems, Ltd., 51/53 Brick Street, London W1Y 7DU, England; Sanders Data Systems, GmbH, 6 Frankfurt am Niederrad, Rennbahnstrasse 72/74, West Germany.





## Message Traffic Monitored By Buffer Control Unit

FREDERICK, Md. — Frederick Electronics is offering a message withhold unit that monitors the messages entering and leaving a buffering device.

The Model 1160 displays a balanced total of the messages entering or leaving the buffering device and displays the difference on a three-digit LED display.

The unit recognizes sequences like an end-of-message sequence to add to or subtract from its counter, with the remaining total showing the number of messages in the buffering device.

The unit handles 5-, 6-, 7- or 8-level asynchronous signals at speeds up to 4,800 bit/sec. The speeds are changeable by "speed chips" that plug into the unit. Sequences for counting messages can also be altered in the field, the firm stated.

The Model 1160 costs \$875 from the firm at P.O. Box 502, 21701.

## Terminal Diskette Has Editing Capability

COSTA MESA, Calif. — Western Telematic, Inc. has brought out a diskette store for teleprinters and CRTs that provides random access to 2K 132-character records in a half second, according to the firm.

Called the DataMaster I, the unit interposes between Ascii printer/display terminals and their data sets through the RS 232 connector. The effect of the device is to add 264K characters to working storage, the firm stated.

An internal text editor provides correction, update and multiple line moving capability. Edit control is done through a

separate control pad, and the user can access any point in the text, overstrike, or release a word or a whole line at a time, a spokesman said.

A user can enter data off-line from equipment such as the GE Terminus 300. On-line interaction can be between computer, disk and keyboard, the spokesman added.

Each line is automatically assigned a number as it is entered which is printed out with the record.

Data rates from 110- to 1,200 bit/sec are switch selectable. The user can also choose between batch or interactive modes and

line printout widths of 72,120 or 132 characters.

All read/write cycles are parity checked. The diskette is removable and has a life of over one million passes for a bit/error rate of less than 1 in 10<sup>9</sup>, Western Telematic stated.

The unit costs \$3,875 with lease and lease/purchase plans available. Delivery is eight weeks from the firm at 3001 Red Hill, 92626.

## Bell-Type 208A Modem Handles 4,800 Bit/Sec

SAN CARLOS, Calif. — GTE Lenkurt has a Bell-type 208A data set which transmits and receives at 4,800 bit/sec.

The 262A modem operates over unconditioned type 3002 channels. Capable of full-duplex operation, the unit is particularly suited for point-to-point and multipoint polling system applications, the firm stated.

The unit offers automatic adaptive equalization, switchable built-in loop test facilities and status indicator lights.

The unit costs about \$3,500 from the firm at 1105 County Road, 94070.

## 103-Type Unit Offered

SUNNYVALE, Calif. — Anderson Jacobson, Inc. has an automatic originate and answer modem compatible with Bell 103A-type units.

The MU 334 has an EIA RS 232 B/C interface. Users can select automatic answer, manual originate or manual answer modes of operation via a control panel.

The MU 334 costs \$525, with deliveries beginning in February from the firm at 1065 Morse Ave. 94086.

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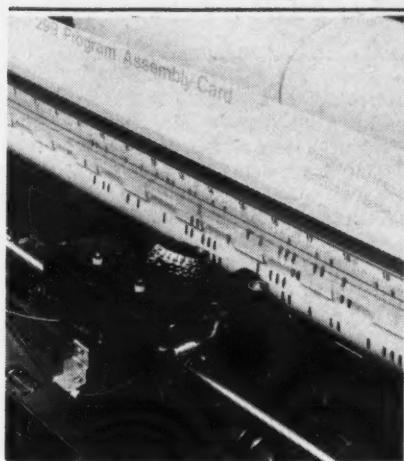
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# SYSTEMS&PERIPHERALS



## NCR 299 Uses 4K-Bit Memory

Although NCR's 299 accounting machine doesn't have the computing power of the smallest IBM System 3 at present, NCR's plans to add peripherals and communications features over the rest of the year could provide users with small amounts of business accounting power in a satellite net. Priced at \$7,250, the 299 has 4K (expandable to 8K) bits of memory almost entirely devoted to applications programming. Programs, based on NCR's concept that "even our salesmen can write them up," require a program coding card to tell the user where to pencil mark a program assembly card which can then be read into the machine through a mark-sense device next to the printing ball.

## Big System Tape Regearred for Minis

EATONTOWN, N.J. — A magnetic tape drive system, formerly available for use with large computers only, is now being offered to the minicomputer user.

The system, DMT 1000, from Diva, Inc., consists of a controller, distribution panel, interconnecting cables and up to four magnetic tape drives as standard, or eight drives as an option. Recording speeds are from 75- to 200 in./sec in a 7-track or 9-track format at densities of 200-, 556-, 800-, or 1,600 bit/in., giving transfer rates up to 320 kbit/sec.

Any industry-compatible 1/2-in. tape reels may be used — from mini reels to 10.5-in. reels, as well as IBM wraparound tape cartridges.

Tape encoding is either NRZI or phase encoding. Different options may be selected for different transports; the controller handles up to eight drives in any combination of 7- or 9-track units.

The system features automatic load and unload, air bearing turn points, vacuum column guidance, photo electric sensing, fixed-position head, single capstan drive, off-line self-testing and IBM compatibility. A controller, 800 bit/in. 9-track drive and all cabling is priced at \$21,725.

Diva is at 607 Industrial Way W., 07724.

## A Look at a Turnkey System — Part II

# It Takes Teamwork to Build a System

By Vic Farmer  
Of the CW Staff

CORPUS CHRISTI, Texas — When a 500-bed hospital here decided to computerize its data entry and administrative message communications system, it hired a company to "do it." That was October 1971 — Memorial Medical Center now has its system working and is converting operations department by department.

Creating the satellite system based on a Varian 620L, cartridge disk and 70 I/O devices was not the work of one person, but took a team of specialists from both the hospital and Automated Systems Corp. (ASC), the vendor, to put it together.

Back in 1971, two systems analysts, one from the hospital and one from ASC, started off by spending over two months going from department to department defining procedures and operations that were then in existence, and defining the procedures and operations that were to make up the new system.

For the greater part of the two-and-a-half years it took the system to come on-line, both the hospital and ASC kept a team of two people working on the system concepts, training people, defining problems and working out alternatives and answers.

Meanwhile, the ASC system analyst served as a project coordinator on the programming side. For two years, ASC used two programmers who had previous experience with the Varian minicomputer, and two programmers who had heavy experience with an NCR 200, the hospital's workhorse computer.

### Staff Turnover

Naturally with a time span of two years, ASC did have some problems with staff turnover, but this never became a "real problem." The programmers, in addition to setting up the system on the mini, had to create a special program that would quickly transfer the data from the satellite system to the NCR 200 mainframe.

The electronic engineering crew from ASC was also faced with a few problems because wiring between the mini and the terminal, printers and card readers ran through a high electrical noise generator — the hospital itself with X-ray equipment, diathermy machines and radiation sources.

Four engineers spent nearly a year designing specialized interfaces at each I/O device that would convert transmissions into a relatively stable series format that worked into and out of the specially built multiplexer that fed the minicomputer

and I/O units.

The engineers also had to design an interface for the Varian 620 to the NCR 200 mainframe that would transfer data somewhat in the same manner that an IBM selector channel would. This interface used about 360 integrated circuits.

Peter Berkowitz, the ASC vice-president in charge of the electronics portion, estimated that in addition to the engineering time, "it took about 4,000 to 5,000 hours just to build the I/O interfaces, parts of the multiplexer and mini-to-mainframe interface."

Company sources at ASC estimate that of the original \$400,000 they charged Memorial Medical Center, 25% was spent on the minicomputer hardware and interface, 37.5% on the multiplexer and about half of the terminals, and another 37.5% on software.

But these same officials indicate they allocated some of their own corporate money, in addition, to polish up the system so it would make a saleable turnkey product, and indeed they cut a year off the time it took to install approximately the same system in another hospital just recently.

Part III will look at more of the electronic problems faced in putting the system together.

## Throughput Upped With Electronic Punch/Verifiers

OAKLAND, Calif. — Data Inscription Service, a keypunch service bureau, faced the task of providing one of California's hospital service companies with computer input from up to 10,000 medical claims daily. The job was all the more formidable because of the possibility of up to 13 different types of claims in the daily processing, with a further possibility of up to seven different card formats for each claim.

Neal McGlashan, founder and president of Data Inscription, took a searching look at the various data entry possibilities, including key-to-tape and key-to-disk systems which were ruled out because of cost and complexity. He finally found his solution in the electronic punch-verifiers manufactured by Tab Products Co., Palo Alto, Calif.

Today, with 36 Tab punch-verifiers installed, Data Inscription is not only meeting the input needs of the hospital service, but because of the increased throughput of the punch-verifiers is able to handle high-volume keypunching for a number of other Bay Area business and government establishments.

In all, Data Inscription is punching and verifying an average of 50,000 cards daily on a two-shift operation.

### Special Features

Key factors in selecting Tab's punch-verifiers, according to McGlashan, were

two of the machine's special features: automatic multi-level program capacity, which enables the operator to punch and verify in one pass jobs having up to 31 different card formats; and automatic constants, which allows the operator to store up to 240 characters for automatic punching under keyboard control.

As McGlashan put it: "Now we have a powerful key-entry system that takes full advantage of the low cost, flexibility and simplicity of punched cards."

The importance of the automatic program sequencing and constants features is illustrated in one of the hospital service jobs that involves three card formats per claim with a total of 200 columns to be punched. Of the 200 columns to be keyed, 11 are duplicated throughout the batch while up to 42 columns can be programmed as constants. One of the three cards has 25 columns punched automatically from constants with only a seven-column field requiring manual punching.

The operators average 26,600 key-strokes/hr on this three-card job, with 9,975 coming from duplication or constants and 16,625 keyed by the operator. And these averages are based on week after week production, not just for certain time periods.

Actually, the operators can achieve far greater production under "all out" conditions. Two of the operators recently

proved this point when they took a 10-to-one bet that they could double a 450 card/hr average on the job over a given period of time. They each won a crisp ten-dollar bill after punching 900 card/hr over a two-hour stretch. McGlashan said such a pace is too demanding on the operators for any long period of time, but it's nice to know the extra machine power is available.

### Monetary Rewards

The operators, who were all experienced IBM and Univac keypunchers, said they preferred the speed and simplicity of the Tab machines, one reason being that their paychecks were increased by a bonus system that rewards them for beating established production quotas on each job.

According to McGlashan, the Tab machines have resulted in at least 25% increases in production over what was previously achieved with IBM and Univac punches.

### Two More Supply Diskettes

Two more companies are offering IBM 3740 type replacement diskettes at \$7.50 per box of 10:

Nashua Corp. is located in Nashua, New Hampshire 03060; and Syncom, Inc. is located at 4565 Genesee St., Buffalo, N.Y. 14225.

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## Books and Brochures

### Microprogrammably Speaking

*A Study of General-Purpose Microprogrammable Computer Architectures*, by Alan B. Salisbury, Document No. AD-768 884/9 WC, National Technical Information Service, P.O. Box 1553, Springfield, Va. 22151, 86 pages, \$3.75.

This report provides a comprehensive framework and descriptive parameters for the analysis of microprogrammable computer architectures. Separate discussions on hardware considerations, microprogramming considerations and control storage considerations are included. Emphasis is on identifying and analyzing those architectural features which provide flexibility and thus enhance the general-purpose capabilities of microprogrammable processors. The concepts of firmware and dynamic microprogramming are examined along with emulation and the universal host machine.

**Paper on the Ring Configuration**

*Partially Connected Multiprocessor*

*Systems: The Ring Configuration*, by J.S. Hill, H.K. Nichols and J.M. Taylor, Document No. AD-769 245/2WC, National Technical Information Service, P.O. Box 1553, Springfield, Va. 22151, 15 pages, \$2.75.

This paper describes Ring configurations as an alternative way of using modular, off-the-shelf computer hardware such as minicomputers, I/O processors and disk controllers to produce flexible high integrity systems suitable for dedicated applications. The main objectives of the Ring are "to provide a system in which the connectivity of the hardware modules and the environment seen by the control software are independent of the overall system size, while retaining the basic advantages of modularity and multiprocessor operation, namely the ability to operate in a load-sharing mode which degrades gracefully under fault conditions."

**Buying a Disk Memory?**

*How to Improve Your Computer's Memory - A Disk Memory Buyer's Guide*, from Engineered Data Peripherals Corp., 1701 Colorado Ave., Santa Monica, Calif. 90404, 24 pages, no charge.

Although this booklet is published by a vendor, it makes no specific mention of its proprietary products. The first part of the guide deals with selection of the right medium, discussing the pros and cons of core memory, magnetic tape and disk drive units (fixed-head, moving-head and floppy disks). The second part is devoted to a discussion of fixed- and moving-head disk drives and some of the factors which must be considered when selecting a disk unit for any minicomputer system.

### Interface Gives PDP-11 Users Graphic Display Capability

SAN DIEGO, Calif. - With its internal semiconductor memory operating at a 50 Hz refresh rate, Megatek's BP-733 graphics display interface enables the PDP-11 user to plot points, lines, alphanumerics and real-time dynamic displays. The memory can be expanded from 256 points to 1K points.

Priced at \$1,890, the new interface and any laboratory X-Y oscilloscope or larger X-Y display provides a full graphics display capability.

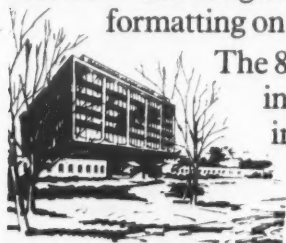
Software is supplied for programming using Basic language commands. Megatek Corp. is at 1055 Shafter St., 92106.

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The 8040 is intelligent. A single-terminal system using dual-cassette storage, it can be programmed to perform computer functions like data validation, editing and error-checking at the point of data entry. It gives you source-document formatting on its CRT screen.



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# COMPUTER INDUSTRY

## CI Notes

### Univac Buys Pertec Units

EL SEGUNDO, Calif. — Pertec Corp. will supply its new shared processor data entry system to Univac under terms of a three-year agreement.

Pertec valued the initial purchase order at about \$4 million and said it expects to supply more than \$15 million of equipment over the three years.

Univac will make a product announcement involving the shared processing system in the near future, according to R.L. Gehring, group vice-president, special products.

### SBC Extends Call/370 to Europe

GREENWICH, Conn. — The Service Bureau Corp. has extended its Call/370 time-sharing service to London and plans call for Brussels and Paris to go on-line by April 1, followed by The Hague, Stockholm and Frankfurt in the third quarter of 1974.

"Our Call/370 expansion represents a significant addition to the services available to multinational companies who can use the network to access a common data base from Europe, Canada and the U.S.," according to H.J. White, vice-president.

The service will be marketed by SBC in the U.S., and by parent company Control Data in Europe.

### Memorex Signs Creditor Accord

SANTA CLARA — Memorex Corp. has signed credit agreements with the Bank of America and the creditors of its subsidiary, ILC Peripherals Leasing Corp., formalizing an accord reached in September deferring certain debt obligations.

Memorex also signed a new agreement with First National City Bank that converts an existing revolving credit to a term loan.

Under the repayment plan, Memorex begins monthly payments in January.

### Informatics to Buy System Three

CANOGA PARK, Calif. — Informatics Inc. has agreed to acquire System Three, Inc. for an undisclosed cash amount. System Three Inc. markets a line of software products for IBM's System/3 and disk packs and other supplies under the brand name of Group/3.

### Supershorts

Telex Corp. has signed an agreement for the sale of some of its tape subsystems to Control Data Corp. The contract is valued at more than \$5 million.

SPL International has formed a mini-computer group to deal with the rapid growth of business in that sector of the computer industry.

Computer Investors Group will market telecommunications products produced by Microdata's Telogic Division.

## Pressures of More Suits Seen Mounting

# Will IBM Settle With Telex Out of Court?

By E. Drake Lundell Jr.  
Of the CW Staff

As the number of suits against IBM based on the decision in the Telex case grows, so does the possibility of an out-of-court settlement in that case, according to several industry observers.

The pressures on IBM are mounting almost daily, these observers indicated, as the stakes in the game are consistently raised.

So far, suits seeking damages amounting to about \$7 billion have been filed against IBM — almost all based at least to some degree on the Telex decision.

And even if those suits are whittled down in the same manner the Telex award was ultimately lessened (Telex got \$260 million after asking for \$1.2 billion), IBM's ultimate bill from such suits could be over \$2 billion, according to

Eugene Collins of Evans and Co., one of the few Wall Street analysts who seriously believed Telex could win its case.

"The stakes are now sufficiently high that the cumulative effect of these progressively higher levels of business risk can now be reasonably referred to as 'The Telex Gamble,'" he said recently.

"At this juncture," he added, "there seem to be three distinct possible future outcomes — with various shades of gray in between. A settlement between Telex and IBM for perhaps \$100 million seems to be the most likely alternative.

"We estimate IBM could then settle all additional claims for \$100 million to \$150 million, reducing total damage exposure to \$200 million to \$250 million.

"Barring a settlement, we believe Judge A. Sherman Christensen's decision in Telex vs. IBM will be upheld under appellate review and affirmed by the Supreme Court. The least likely alternative, in our opinion, is that IBM will be successful in

winning a reversal of the Telex decision," Collins stated.

### Need Not Prove Monopoly

The legal doctrine of "collateral estoppel" might be an influence pushing IBM toward a settlement, some sources indicated.

Under this doctrine, another firm suing IBM would not have to prove that IBM was a monopoly and used monopolistic practices since that has already been proven in the Telex case. All the firm would have to do would be to prove it was damaged by such actions on the part of IBM and the amount of damages.

To date Calcomp has already asked the court hearing its case against IBM for a summary judgment against IBM based on the doctrine.

But it appears that if IBM settles out of court now — before the appeals are heard — the doctrine could not apply and each of the litigants would have to undertake the time-consuming and expensive (Telex attorney fees were more than \$1.5 million) process of discovery and trial, with uncertain chances of success in each new court.

### Other Settlements?

Therefore, many industry sources indicated, it would be fairly easy to get most of the other litigants to settle their cases for relatively little if IBM could agree with Telex to call off its action in return for an out-of-court settlement, which would probably be accepted by Telex since it needs the money.

However, some other industry sources — and IBM attorneys — claim IBM would really like to take the case through the appellate process to get a definitive ruling, since even a tacit acceptance of the Telex ruling would cause IBM to radically change the way it does business.

## The Talk of The Industry

## IBM Reorganizes Three Units, General Systems to Sell S/3, S/7

By Molly Upton  
Of the CW Staff

ARMONK, N.Y. — IBM is effecting organizational changes in the Data Processing, Field Engineering and General Systems divisions in a move designed to "bring decision-making closer to the operating level. By making IBM more responsive we will improve our ability to serve our customers," according to Chairman Frank T. Cary.

The General Systems Division, which develops and manufactures IBM's Systems/3, 7 and related equipment, will now market and service its products serving those customers who normally do not require larger IBM systems, the firm said.

In the Data Processing Division, 14 new regional offices will replace the existing 19 district and three regional offices.

The Field Engineering Division is establishing 14 new regional offices succeeding its existing area and regional offices.

One source speculated this could be a step designed to facilitate divestiture of part of IBM, should the company decide to do so in order to extricate itself from charges of monopoly of the industry.

Industry spokesmen generally took a wait-and-see attitude, remarking that a "realignment" in itself did not appear to be very significant, although many conceded the motive may have been to lay the groundwork for a possible spinoff.

"It's a possibility," observed Jerry Dreyer, executive secretary of the Association of Data Processing Service Organizations.

"This may be initiating steps, although I don't think so," Dreyer said he thought IBM's strategy was to postpone the government trial indefinitely.

Dan McGurk, president of the Computer Industry Association, said, "I don't really attach huge significance to that step. I gather it's one step in the changing IBM structure and it would be hard to make a definitive comment until you see how anything else might unfold."

"The first question I'd ask is, 'Are they organizing it so that if they had to make a split that would be one place they would split,'" commented Dave Ferguson, founder of Group/3.

## Computer Caravan Ready to Roll

NEWTON, Mass. — The 1974 U.S. Computer Caravan opens February 20 with over 50 companies signed on for the 10-city tour.

"Virtually every product area is represented," according to Neal Wilder, national sales manager of *Computerworld*, sponsor of the traveling forum and exhibition.

This is the year of the minimaker, however, with DEC, Data General, Hewlett-Packard, Modcomp, Cincinnati Milacron, Texas Instruments, Interdata, Prime and Lockheed all on board.

New exhibitors include Control Data Corp., University Computing Co., Inter-

tel, Scope Data, Pansophic, Raytheon, Stromberg-Datagraphix, California Computer Co. (a returnee from 1972), Pertec, Shugart, MSI and Gould.

Caravan organizers are anticipating a total attendance of over 40,000. Noting that last year's exhibitors averaged over \$1 million apiece in Caravan-connected sales, Wilder said, "We expect to top that figure this year."

Caravan attendees represent installations with a buying power of around \$9 billion, he noted.

And, with reduced airline flights, the local Caravans should prove even more attractive buying alternatives, organizers suggested.

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## Lack of Trained Personnel Only Problem

# Tymshare Sets Sights on 370 Market

By Marvin Smalheiser  
CW West Coast Bureau

CUPERTINO, Calif. — The major marketing effort by Tymshare this year will be in the IBM 370 market, according to President Thomas J. O'Rourke.

Tymshare recently obtained a 370/158 for its time-sharing network and will emphasize business and commercial applications, an area in which O'Rourke feels Tymshare has done a great deal developing new applications.

Tymshare's equipment includes the 158 in Palo Alto; 17 Xerox 940s and five Digital Equipment Corp. PDP-10s in Cupertino; four Xerox 940s in New Jersey, four 940s in Houston; a 940 in Paris, and about 100 Varian minicomputers serving as links in the network to larger CPUs.

O'Rourke said, "Our biggest problem in the time-sharing industry at the growth rates we're experiencing is hiring and training enough good people fast enough."

The growth in the future, he said, will be with a "whole new variety of applications and services not available in the past."

He cited improved data communications capability as a case in point, enabling firms now to run as many as 50 users simultaneously, reducing costs and improving reliability.

### Growth Goals

"We're providing a service most people do not want to provide themselves or cannot afford to."

"We have established our credibility and reliability. Our uptime is 99.5% or better on our machines," he added.

The key to time-sharing profitability and growth, O'Rourke said, is in three factors; marketing, data transmission capability, and research and development.

Half of Tymshare's personnel is in marketing. "We're a service business and we must provide customer support. We've worked hard over the years to build it," he said.

Some of the equipment Tymshare has needed for its network came through its own research and development, although O'Rourke said he prefers to buy in the open market.

Currently, Tymshare is funding 6% of total revenues into research and development.

Revenues for calendar 1973, he said, will be about \$23 million to \$24 million with profit up "considerably."

The customer base is about 2,000 with a total of about 15,000 to 20,000 users' names on the system.

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## New CLA President Planning Active Year

WASHINGTON, D.C. — Michael J. Creedon has been elected president of the Computer Lessors Association.

Creedon, executive vice-president, marketing for DPF, Inc., emphasized that he will chart a more active course for the leasing group.

"The Computer Lessors Association must bring to the attention of data processing and financial executives, and to the business community in general, the continued viability of the System 360, both in economic and in technological terms," he said. "In view of the energy crisis and the overall economic outlook for 1974, DP users must take a hard look at the economies offered by the System 360 and its enhancement programs," he added.

There are 11 CLA member companies: Computer Leasing Co.; Continental Computer Associates, Inc.; DPF, Inc.; DPA, Inc.; Dearborn Computer Leasing; Diebold Computer Leasing, Inc.; Granite Computer Leasing; Greyhound Computer Corp.; Itel Corp.; National Computer Rental, Ltd.; and Talcott Computer Leasing.

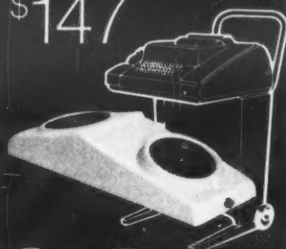
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## Slow First Half Anticipated 10% Rise in '74 Shipments Expected

SYRACUSE, N.Y. — "Growth in shipments of U.S.-produced computer systems in 1974 should register about 10% — somewhat slower than the last two years but still at record

levels," predicted George B. Farnsworth, vice-president and general manager of the GE Electronic Components Business Division.

Farnsworth said electronic

component sales for 1974 are expected to increase about 5% over 1973. The industry posted a 22% increase in 1973 over the previous year, according to a GE experts report.

"Considering multiple ordering and extended ordering for future production beyond normal lead times, there should be enough momentum to carry the industry over a slow first half of 1974 — which is what we anticipate," Farnsworth said.

### High-Growth Areas

Intelligent terminals, both general purpose and special function such as point-of-sale, should show growth in excess of 25%, he said. Other high-growth areas include data communications equipment of all types and mini-computers, he noted.

He also pointed out that the use of such components as LSI chips, semiconductor memories, CRT displays, etc., has resulted in faster speeds, greater data storage and access, and overall size reductions thus opening up new markets and applications for peripheral equipment.

He noted, however, that "it is too early to determine the full impact of the energy crisis on EDP spending plans."

## HIS Posts 'Strongest Volume Year'

WALTHAM, Mass. — Honeywell Information Systems' 1973 growth was balanced between the U.S. and European markets and large systems volume in each of these market areas constituted a growing part of the company's overall computer activity, according to C.W. Spangle, executive vice-president.

Last year was the strongest volume year in the history of Honeywell's computer business, he said.

Series 6000 orders came from manufacturers, banks and governments in the U.S. and throughout Europe, he noted.

Honeywell has also installed more than \$100 million worth of Series 6000 computers to date as part of the Defense Department's Worldwide Military Command and Control System, he added.

While mid-range systems shipments were below 1972 figures, the 2000 series shipments were at record levels, Spangle said,

adding that the small-scale Model 58 also had a record year.

"Its performance in the U.S. is especially gratifying because the 58 demonstrates that European-designed and built computers can be highly successful in the U.S.," he said. The 50 series is built by Compagnie Honeywell Bull in France.

Spangle said the value of Honeywell net exports of computer equipment grew to almost \$90 million this year and it is expected to increase in 1974.

Important progress in gaining new international business has been made outside Europe, with an Iranian firm, Isiran, named the exclusive distributor of Honeywell computer products and services in the burgeoning Iranian computer market, he said. Technical liaison offices of Nippon Electric Co. and Toshiba with Honeywell's computer operations have been established in the U.S. and strengthened during the year.

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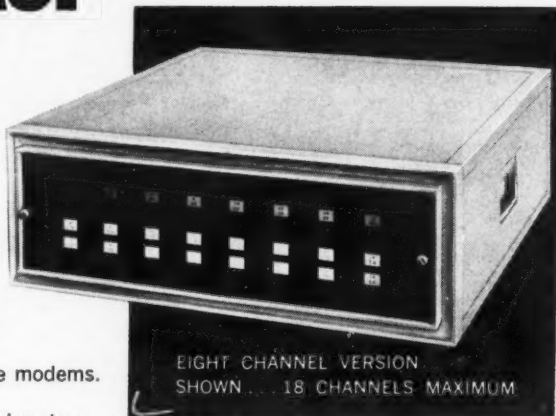
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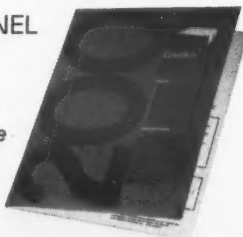
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## Spirit of Cooperation Gets Job Done on Time

PALO ALTO, Calif. — Delivery and installation of a 360/65 in 11 days? That's only part of the story of an effort involving Evergreen Computer and Financial, Inc., International Timesharing Corp. (ITS).

When ITS acquired Allen-Babcock from Tymshare, it had 15 days to come up with a way to provide the AB customers with service they were currently getting on a 370/158 from Tymshare. ITS had CDC 3300 and Honeywell 1648 systems, and decided to procure a 360/65 for which the Allen-Babcock equipment had originally been designed.

ITS selected Evergreen, a used computer dealer, to procure and install the equipment. Evergreen then had 11 days to deadline.

"IBM couldn't deliver and install a new 360/65 system on such short notice and we were faced with the job of locating equipment that was already in existence, transporting it across the country to a site that didn't yet exist, and seeing that it was installed and working — all within a very short time," said Floyd Peterson, president of Evergreen.

"The time-sharing application of the planned 360/65 required a very sophisticated system and a sophisticated environment. And a lot of front-end communications hardware had to go with it — the telephone company had to hook up 144 telephone lines," he said.

By way of comparison, Peterson pointed out that a 360/30 requires 30 to 45 days to locate the equipment, deinstall it, pack and ship it, reinstall it and complete all diagnostic testing.

"Almost overnight, we had to locate, check out and purchase the components of a very complicated computer system," Peterson said. In all, 49 pieces of equipment were located in eight cities across the nation and rushed to Palo Alto.

The mainframe came from the East Coast, and the 2.5M bytes of memory were supplied by Electronic Memories and Magnetics Corp.

"We were confident we could meet the tight delivery requirement," said Ed Farris, EMM vice-president, "but installing the complete system by deadline — with I/O set, disk files, tape files and communications equipment — appeared to be nearly impossible. The challenge was exciting, and we chose to do what we could to help."

ITS procured a vacant building that had formerly housed a Service Bureau Corp. facility.

At one time, there were approximately 50 people working side-by-side to get the system running.

"This installation had special requirements that required special people to accomplish it," Peterson said. "The IBM mainframe was being mated to EMM core, so we had to modify the mainframe at the installation site. Also, we had to build all of the fifth-port hardware on site, assemble 2.5M bytes of core, put in 27 spindles of disks, plus a fast I/O set with three tape drives."

Since the 360/65 had formerly been half of a multiprocessor system, it had to be reconfigured

to a simplex system. Additionally, changes had to be made within the processor to properly address memory in 512K byte blocks rather than 256K.

An IBM reconfiguration panel, which allows memories to be reassigned when a memory unit fails, was part of the system — and it, too, had to be reconfigured to accept 512K byte memory blocks.

"This was the first time EMM had made these reconfiguration changes to a processor that originally had been part of a multiprocessor system," said Farris. "Also, it was the first time EMM had interfaced through an IBM reconfiguration control panel."

"I think the fact that we were attempting something that had never been done before really motivated everyone," said Dennis Mooney, Evergreen's director of operations.

### Forest Leaves Post

LOS ANGELES — Robert B. Forest has left his post as editor of *Datamation* after 10 years with the magazine.

Forest's new position is vice-president of Performance Communications International in France, a subsidiary of the New York public relations/marketing services firm, Performance Communications, Inc.

Forest is succeeded by John L. Kirkley, former articles editor for *Datamation* and before that editor and publisher of *Computer*, the official publication of the IEEE Computer Society.

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## REI Year-End Earnings Decline

DALLAS — Recognition Equipment, Inc. reported increased fourth-quarter losses and decreased earnings for the year ended Oct. 31, even after inclusion of a \$3.3 million gain from sales of Docutel Corp. securities.

While revenues for the year declined by 3%, the year-end backlog of signed contracts at purchase value stood at a new peak, 49% above the year earlier level.

Fourth-quarter losses nearly doubled to

\$906,000 from \$475,000 in the same year-ago period, while revenues were down slightly to \$13.4 million from \$13.9 million.

Fourth-quarter figures included an extraordinary loss of \$842,000 in 1973, compared with a special credit of \$87,000 in 1972. The company said the reduction in estimated income tax benefits from operating loss carryforwards for the fourth quarter of 1973 resulted primarily from current operating losses incurred by the parent company, which eliminated the parent's U.S. federal income tax provision before benefits from operating losses.

Earnings for the year were \$324,000 or 6 cents a share, including a \$194,000 or 4 cents a share special credit. This compares with earnings of \$342,000 or 7 cents a share for 1972, after a \$719,000 or 14 cents a share special credit.

The company would have shown a loss for 1973 had it not been for the \$3.3 million gain from sales of Docutel securities. The gain is treated as ordinary rather than extraordinary income in conformance with a recently adopted change in accounting principles.

Revenues declined from \$43 million to \$41.7 million.

## Hazeltine Earnings Fall in 9 Months

GREENLAWN, N.Y. — While Hazeltine Corp.'s revenues for the nine months rose 30%, earnings declined substantially, due mostly to a \$3.6 million special credit in 1972.

For the nine months, earnings declined to \$1.5 million or 77 cents a share from \$3.9 million or \$1.98 a share a year ago.

Revenues rose to \$54.8 million from \$41.2 million.

In the three months, Hazeltine posted earnings of \$593,000 or 31 cents a share, compared with \$3.4 million in the same 1972 quarter.

Revenues for that period increased to \$17.9 million from \$14 million and include revenue from all marketing of peripheral equipment. Since April 1, 1973, the units have been sold outright by Hazeltine to an unrelated lessor which then rents it to customers.

Both 1972 periods included a special credit of over \$3 million for tax-loss carryforwards and gains on the sale of property.

President David Westermann said the Industrial Products Division increased its shipments to \$4.9 million for the quarter, up over 30% from a year ago, and the current backlog of \$12.6 million includes \$5.3 million in peripheral equipment.

## ...Toward the Bottom Line

Although first quarter revenues rose almost 6% at Potter Instrument, the firm lost \$350,685 or 16 cents a share compared with earnings of \$141,187 or 5 cents a share in the year-ago period.

Production bottlenecks caused by parts shortages of critical components were mainly responsible for the deficit, according to President George W. May.

Revenues rose to \$11.4 million from \$10.7 million in the year-ago period.

\$\$\$

No shortage of shortages! Redactron anticipates a loss for the second quarter ended Dec. 31 due to a shortage of materials and parts. On the brighter side, the firm has completed a financing agreement with Equipment Ventures for \$375,026.

\$\$\$

Comten reported a turnaround in the nine months. The communications firm earned \$208,200 or 10 cents a share on revenues of \$6 million, compared with a loss of \$217,700 or 11 cents a share on revenues of \$4.2 million in the same period last year.

\$\$\$

Tycom has received a \$200,000 loan from Nashua in return for a sublicense to manufacture the Holmes Tycom baseplate used in conjunction with the Savin Business Machine Corp. Word Master 900 product line.

\$\$\$

Centronics Data Computer Corp.'s first-quarter earnings more than doubled to \$1.8 million or 37 cents a share in the period ended Sept. 30. Earnings for 1972 were \$667,000 or 13 cents a share. Revenues increased to \$8.4 million from \$3.6 million in the same year-ago period.

\$\$\$

Sycor has converted into common stock all of its 6% convertible subordinated promissory notes due Dec. 31, 1975 and all outstanding preferred shares. The firm now has over 2.7 million shares of common outstanding.

\$\$\$

Information Science Industries, Ltd. said it has eliminated its debt by leasing rather than purchasing its presently installed Burroughs computer.

\$\$\$

Data General is now listed on the New York Stock Exchange.

\$\$\$

An "all-time high worldwide demand for semiconductor components" increased National Semiconductor's first quarter sales 126% to \$52.1 million compared with nearly \$23 million a year ago. Earnings soared to almost \$4 million from \$707,000 in the year-ago period.

## 360 Systems dpf INCORPORATED

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## Used Computer Firms File Reports

Two used computer dealers reported record year-end revenues and earnings and another experienced an anticipated decline in sales and earnings in the three months ended Sept. 30.

At Comdisco, Inc., Des Plaines, Ill., earnings rose to \$1.1 million or 95 cents a share, up 76% from \$652,097 or 63 cents a share in the prior year.

Revenues totaled \$24.1 million compared with \$14.9 million for the previous year, an increase of 63%.

And at IPS...

At IPS Computer Marketing Corp., Englewood Cliffs, N.J., earnings for the year increased to \$154,682 on revenues of \$7.8 million from \$140,760 on revenues of \$5.4 million in 1972.

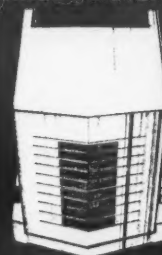
Per share earnings for 1973 were 32 cents compared with 41 cents a year ago, reflecting the dilutive effect of the public stock offering in June 1972.

The Computer Exchange reported an anticipated loss of \$43,975 on revenues of \$1.1 million, compared with earnings of \$33,794 on revenues of \$1.8 million in

the same year-ago period. The loss was attributed to slackening hardware sales and a reorganization of the firm's Oakland, Calif., data center.

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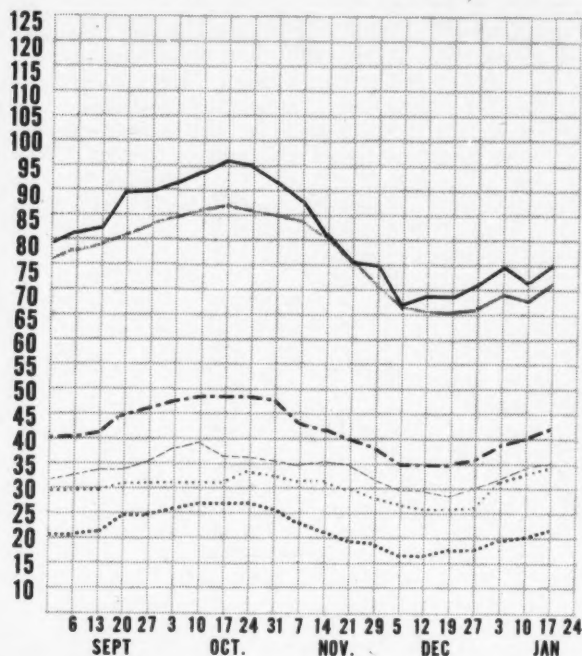


## Earnings Reports

GENERAL DATACOMM INDUSTRIES			WANG LABORATORIES			NATIONAL SEMICONDUCTOR		
Year Ended Sept. 30			Three Months Ended Sept. 30			Three Months Ended Dec. 16		
1973	1972		1973	1972		1973	1972	
Shr Ernd	\$ .27	\$ .38	Shr Ernd	\$ .20	\$ (.03)	Shr Ernd	\$ .81	\$ .19
Revenue	6,815,875	4,966,518	Revenue	12,911,248	8,004,401	Revenue	48,283,000	20,929,000
Tax Cred	196,220	226,900	Earnings	1,348,434	(188,626)	Earnings	3,335,000	733,000
Earnings	386,224	472,710				6 Mo Shr	1.79	.38
						Revenue	100,337,000	43,886,000
						Earnings	7,313,000	1,440,000
CAMBRIDGE MEMORIES			AUTEX			COMPUSCAN		
Three Months Ended Dec. 1			Year Ended Sept. 30			Three Months Ended Nov. 30		
1973	1972		1973	1972		1973	1972	
Shr Ernd	\$ .18	\$ .09	Shr Ernd	.....	\$ .58	Shr Ernd	\$ .15	\$ .11
Revenue	5,018,515	1,896,581	Revenue	\$5,625,347	4,521,884	Revenue	1,801,000	1,408,000
Tax Cred	.....	57,000	Spec Item	a71,578	b83,000	Tax Cred	97,000	73,000
Earnings	240,869	118,099	Earnings	(217,222)	317,565			
			a-Debit; costs of canceling office building construction. b-Tax credit.					

**COMPUTERWORLD Computer Stocks Trading Indexes**

Computer Systems	Software & EDP Services
Peripherals & Subsystems	Leasing Companies
Supplies & Accessories	CW Composite Index



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Data Dictionary/Directory

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CORPORATION**

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(617) 272-3450

## Computerworld Stock Trading Summary

All statistics compiled,  
computed and formatted by  
**TRADE★QUOTES, INC.**  
Cambridge, Mass. 02139

E	.-----PRICE-----.			
X	1973-74	CLOSE	WEEK	WEEK
C	RANGE	JAN 17	NET	PCT
H	(1)	1974	CHNGE	CHNGE

## COMPUTER SYSTEMS

N	RURROUGHS IRP	175-252	199 3/4	+24 1/2	+13.9
N	COLLINS RADIO	16-26	24 3/4	0	0.0
O	CONTROL AUTOMATION	5-20	13 1/2	+1 7/8	+16.0
O	CONTROL DATA CORP	3-62	30 1/8	+1 1/8	+3.0
O	DATA GENERAL CORP	28-29	38 3/8	+8 1/4	+27.3
O	DATAPoint CORP	10-21	12 1/2	-1/2	-3.8
O	DIGITAL COMP CONTROL	2-6	2 1/8	0	0.0
N	DIGITAL EQUIPMENT	73-117	95 1/2	+10 7/8	+12.8
N	ELECTRONIC ASSOC.	2-9	3	+1/8	+4.3
A	ELECTRONIC ENGINEER.	6-14	8 3/4	+1/4	+2.9
N	FOXBORO	23-48	46 5/8	+1 5/8	+3.6
O	GENERAL AUTOMATION	22-55	33 1/2	+2 1/2	+8.0
O	GRI COMPUTER CORP	1-3	3/4	-1/8	-14.2
N	HEWLETT-PACKARD CO	70-99	78 1/2	+8 5/8	+12.3
N	HONEYWELL INC	68-139	80 1/8	+7 1/8	+9.7
N	IRM	227-340	250 3/4	+21 3/4	+9.4
O	INTERDATA INC	7-14	9 1/2	+1 1/4	+15.1
O	MICRODATA CORP	2-10	3 5/8	-1/8	-3.3
N	NCR	27-46	31 5/8	+2 3/4	+9.5
N	RAYTHEON CO	22-35	30 1/2	+2 1/8	+7.5

## LEASING COMPANIES

A	BOOTHE COMPUTER	1	5	1 1/8	0	0.0
N	BRESNAHAN COMP.	1	2	2	0	0.0
O	COMDISCO INC	4	17	5 7/8	+ 1/8	+2.1
O	COMMERCE GROUP CORP	3	6	5 1/2	+ 3/4	+15.7
O	COMPUTER EXCHANGE	1	1	1 1/4	0	0.0
A	COMPUTER INVSTRS GRP	2	8	2 1/4	0	0.0
O	COMP. INSTALLATIONS	1	2	1	0	0.0
M	DATRONIC RENTAL	2	3	1 3/8	0	0.0
A	DCL INC	0	3	5/8	0	0.0
A	DEARBORN-STORM	12	26	18 1/8	+2 5/8	+16.9
N	DPF INC	3	9	3 5/8	+ 1/8	+3.5
O	EDF RESOURCES	1	3	3 1/4	0	0.0
A	GRANITE MGT	2	6	2 1/8	+ 3/8	+15.0
A	GROUNDHOG COMPUTER	3	6	5 3/4	- 1/8	-2.1
A	ITEL	4	12	4 7/8	+ 1/4	+5.4
N	LEASCO CORP	8	18	9 1/8	+ 1/4	+2.8
O	LEASPAC CORP	1	8	1 3/8	0	0.0
O	LECTRO MGT INC	1	2	3/8	0	0.0
O	NWG INC	3	15	5 1/4	+ 1/2	+10.5
A	PIONEER TEX CORP	4	8	4 5/8	+ 1/8	+2.7
A	ROCKWOOD COMPUTER	1	3	1	+ 1/8	+14.2
N	U.S. LEASING	16	36	18 3/8	- 7/8	-4.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH  
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER  
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID  
(1) TO NEAREST DOLLAR

	PRICE			
	1973-74	CLOSE	WEEK	WEEK
	RANGE	JAN 17	NET	PCT
	(1)	1974	CHNGE	CHNGE

## SOFTWARE &amp; EDP SERVICES

A	ADVANCED COMP TECH	1	2	1 3/8	- 1/8	-8.3
A	APPLIED DATA RES.	2-	4	2	+ 1/4	+14.2
N	APPLIED LOGIC	1-	3	1 1/4	- 1/8	-33.3
N	AUTOMATIC DATA PROC	39-	94	58 1/8	+5 1/8	+10.0
O	BRANDON APPLIED SYST	1-	1	3/4	0	0.0
O	CENTRAL DATA SYSTEMS	3-	9	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	1-	5	2 3/8	- 1/8	-5.0
O	COMPUTER DYNAMICS	1-	2	1 1/2	0	0.0
O	COMPUTER HORIZONS	1-	6	3 3/4	+1 3/4	+87.5
O	COMPUTER NETWORK	1-	5	1 3/8	+ 3/8	+37.5
N	COMPUTER SCIENCES	2-	6	2 7/8	+ 3/8	+15.0
O	COMPUTER TASK GROUP	1-	2	3/4	+ 1/8	+20.0
O	COMPUTER TECHNOLOGY	1-	3	1 1/2	0	0.0
O	COMPUTER USAGE	3-	9	3 7/8	+ 1/4	+6.8
O	COMPRESS	1-	2	1 1/4	0	0.0
O	COMSHARE	2-	9	2 1/2	+ 1/4	+11.1
N	CORDURA CORP	3-	15	3 1/4	+ 1/4	+8.3
O	DATATAB	1-	4	1 3/8	0	0.0
A	ELECT COMP PROG	1-	2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	20-	56	23 1/4	- 3/8	-1.5
O	INFONATIONAL INC	1-	2	3/8	0	0.0
O	INFORMATICS	2-	6	5 7/8	+ 1/4	+4.4
O	I.O.A. DATA CORP	1-	1	3/8	0	0.0
O	IPS COMPUTER MARKET	1-	5	1	0	0.0
O	KEANE ASSOCIATES	2-	5	2	0	0.0
O	KEYDATA CORP	4-	12	5 7/8	+ 1/4	+4.4
A	LOGICON	2-	7	2 1/4	+ 1/8	+5.8
N	MANAGEMENT DATA	1-	5	1 1/2	- 1/8	-7.6
O	NATIONAL CSS INC	18-	42	32	+4 1/2	+16.3
O	NATIONAL COMPUTER CO	1-	1	3/8	0	0.0
O	NATIONAL INFO SRVCS	1-	2	1/4	0	0.0
P	ON LINE SYSTEMS INC	12-	25	23 3/8	+ 5/8	+2.7
N	PLANNING RESEARCH	2-	7	2 5/8	- 1/4	-8.6
O	PROGRAMMING METHODS	17-	25	17	0	0.0
O	PROGRAMMING & SYS	1-	1	3/4	0	0.0
O	RAPIDATA INC	3-	24	3	- 7/8	-22.5
O	SCIENTIFIC COMPUTERS	1-	3	5/8	0	0.0
O	SIMPLICITY COMPUTER	1-	4	1 1/8	- 1/8	-10.0
O	TRS COMPUTER CENTERS	2-	9	8 1/2	0	0.0
O	TCC INC	2-	1	3/8	- 1/8	-25.0
O	TYNESHARE INC	6-	13	7 3/4	- 1/8	-1.5
O	UNITED DATA CENTER	3-	6	3 1/4	0	0.0
A	URS SYSTEMS	2-	8	3 1/2	+ 1/2	+16.6
N	WJLY CORP	3-	11	4 1/8	- 1/8	-2.0

## PERIPHERALS & SUBSYSTEMS

ADDRESSOGRAPH-MULT	9- 34	9 5/8	- 1/8	-1.2
ADVANCED MEMORY SYS	4- 23	6 3/4	+2 1/4	+68.1
AMPEL CORP	3- 7	4	+ 5/8	+18.5
ANDERSON JACOBSON	2- 6	2 1/4	0	0.0
BEEHIVE MEDICAL ELEC	4- 10	6 1/2	+1 1/4	+23.8
BOLT-BERANEK & NEW	6- 12	7 7/8	+ 1/4	+3.2
BUNKER-RAMO	6- 18	7 5/8	+ 1/8	+1.6
CALCOMP	5- 16	8 7/8	+1	+12.6
CAMBRIDGE MEMORIES	8- 17	15 1/4	+ 3/4	+5.1
CENTRONICS DATA COMP	13- 38	20 1/4	+2 3/4	+15.7
CODEX CORP	8- 19	10 1/2	+1	+10.5
COGNITRONICS	1- 3	5/8	+ 1/8	+25.0

	-----PRICE-----			
F	1973-74	CLOSE	WEEK	WEEK
X	RANGE	JAN 17	NET	PCT
C	(1)	1974	CHNGE	CHNGE
M				

A	COMP	COMP	COMMUN.	1-	4	1 1/4	+ 1/8	+11.1
A	COMPUTER EQUIPMENT	1-	3	1 3/4	- 1/4	-12.5		
O	COMPUTER MACHINERY	4-	13	4 3/4	+ 1/4	+5.5		
O	COMPUTER TRANSCIVER	1-	6	1 1/2	- 3/8	-20.0		
N	CONRAC CORP.	13-	32	13 3/4	- 3/8	-2.6		
O	DATA ACCESS SYSTEMS	1-	3	1 1/4	+ 1/8	+11.1		
O	DATA 100	9-	19	10 3/8	+ 1/4	+2.4		
A	DATA PRODUCTS CORP.	2-	5	3 1/4	+ 1/4	+8.3		
O	DATA RECOGNITION	2-	3	1 1/2	0	0.0		
O	DATA TECHNOLOGY	1-	5	2 3/8	+ 3/8	+18.7		
O	DECISION DATA COMPUT	6-	40	7 1/4	+1 1/4	+20.8		
O	DELTA DATA SYSTEMS	1-	1	1 1/2	0	0.0		
O	DI/AN CONTROLS	1-	4	1 5/8	+ 1/8	+8.3		
N	ELECTRONIC M & M	3-	6	3 5/8	+ 1/4	+7.4		
O	FABRI-TEK	2-	5	2 3/8	0	0.0		
O	GENERAL COMPUTER SYS	3-	9	3 1/4	+ 1/4	+8.3		
N	GENERAL ELECTRIC	56-	76	63	+3	+5.0		
N	HAZELTINE CORP	4-	9	4 7/8	+ 1/8	+2.6		
O	INFOREX INC	3-	23	3 7/8	- 1/4	-6.0		
O	INFORMATION DISPLAYS	1-	2	1 1/2	0	0.0		
O	INFORMATION INTL INC	8-	15	11 3/4	+ 1/2	+4.4		
A	LUNDY ELECTRONICS	3-	9	2 7/8	0	0.0		
O	MANAGEMENT ASSIST	1-	1	1 1/4	0	0.0		
N	MEMOREX	2-	19	2	+ 1/8	+6.6		
A	MILGO ELECTRONICS	14-	28	16 1/4	+2 1/8	+15.0		
N	MONARK DATA SCI	2-	13	3 1/4	+ 1/4	+8.3		
O	ODEC COMPUTER SYST.	2-	6	2 5/8	0	0.0		
O	OPTICAL SCANNING	2-	8	3 1/2	+ 1/2	+16.6		
O	PERTEC CORP	3-	8	5	+ 5/8	+14.2		
O	PHOTON	3-	7	3 3/4	0	0.0		
A	POTTER INSTRUMENT	2-	9	3 1/8	+ 1/8	+4.1		
O	PRECISION INST.	2-	6	1 3/4	0	0.0		
O	QUANTOR CORP	4-	10	4 1/4	- 1/4	-5.5		
O	RECOGNITION EQUIP	2-	8	3 1/2	+ 1/2	+16.6		
N	SANDERS ASSOCIATES	6-	18	7 1/2	+ 3/8	+5.2		
O	SCAN DATA	1-	6	2	+ 1/4	+14.2		
O	STORAGE TECHNOLOGY	11-	34	13	+1	+8.3		
O	SYCOR INC	9-	20	9 1/2	+ 3/4	+8.5		
O	TALLY CORP.	2-	14	2 1/8	0	0.0		
O	TEC INC	5-	9	5 3/4	0	0.0		
N	TEKTRONIX INC	30-	55	40 3/8	+4 3/8	+12.1		
N	TELEX	3-	8	3 5/8	+ 3/8	+11.5		
O	WANGCO INC	7-	13	8 1/2	- 1/4	-2.8		
O	WILTEK INC	7-	18	7	0	0.0		

## SUPPLIES & ACCESSORIES

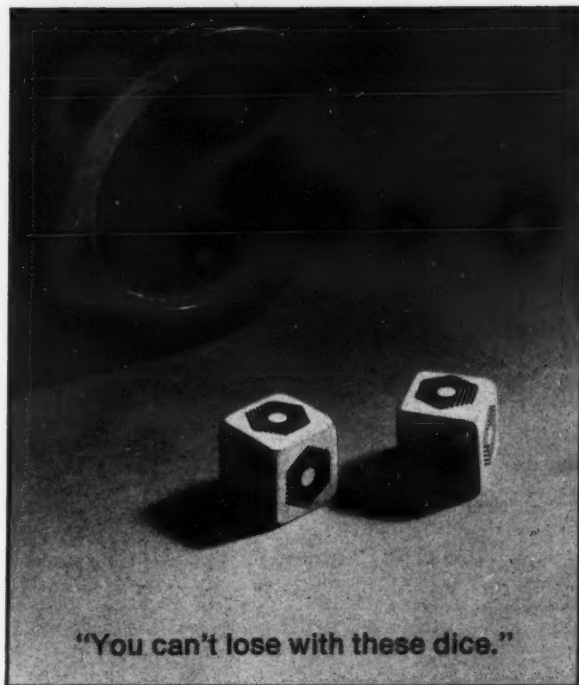
O	BALTIMORE BUS FORMS	5- 9	5	0	0.0
A	BARRY WRIGHT	5- 13	5 3/4	+ 1/2	+9.5
O	CYBERMATICS INC	1- 3	1 5/8	+ 1/2	+44.1
A	DATA DOCUMENTS	17- 26	23 3/4	+ 3/4	+3.2
O	DUPLEX PRODUCTS INC	6- 10	7 1/2	+ 3/8	+5.2
N	ENNIS RAS. FORMS	5- 8	6 1/8	+ 3/8	+6.5
O	GRAMHAM MAGNETICS	7- 20	9	+ 3/4	+9.0
A	GRAPHIC CONTROLS	7- 12	7 5/8	+ 1/4	+3.3
N	JM COMPANY	71- 91	76 1/8	+ 1 1/2	+6.8
O	MOORE CORP LTD	51- 65	52 1/2	+ 1 3/4	+3.4
N	NASHUA CORP	36- 58	44 1/8	+2 5/8	+6.3
O	REYNOLDS & REYNOLD	26- 51	30	+2	+7.1
N	STANDARD REGISTER	11- 20	13	+ 1/2	+6.0
O	TAB PRODUCTS CO	7- 23	7	0	0.0
N	UARCO	15- 23	16 3/4	0	0.0
A	WABASH MAGNETICS	5- 8	6	- 1/8	-2.0
N	WALLACE BUS FORMS	15- 26	15	0	0.0



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